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COMPUTERWORLD

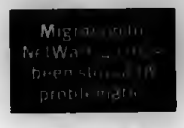
Novell pushes out quick fix to 4.0 woes

Cheaper, more stable NetWare 3.11 may be stalling migration

By Michele Dostert
PROVO, UTAH

■ Tea weeks after Novell, Inc. delivered its long-awaited NetWare 4.0 to mixed reviews, the company has brought out enhancements aimed at improving the network operating system's performance. The enhancements also ease development of network management applications.

Possibly because users are not flocking to NetWare 4.0, the release of NetWare 4.01 could be the fastest NetWare fix ever. It took Novell more than a year-and-a-half after shipping NetWare 3.0 to get all the bugs out and produce a stable product with NetWare v3.11, according to Craig Burton, president of The Burtou Group, a Salt Lake City market research firm.



An official from NetWare reseller and systems integrator Application Systems Group in Stoneham, Mass., said he believes that while 4.0 is strategic, v3.11 is the benchmark today. "It will take a year to a year-and-a-half before 4.0 passes 3.0 as the implementation standard," predicted Drew Finnie, the firm's technology adviser.

To speed that migration, NetWare 4.01 contains fixes to both the NetWare Directory Services and the problem-laden Virtual Loadable Module client software for DOS and Windows — two major sticking points with NetWare 4.0 evaluators.

Novell officials claimed that NetWare 4.0 sales are right on target,

Novell, *page 14*

Faster 486 could overlap Pentium

By Michael Fitzgerald
SANTA CLARA, CALIF

Pentium is taking a temporary backseat at Intel Corp. in favor of a revved-up version of the 1486, which is due out in the fourth quarter, sources close to the firm said.

The DX3 processor is expected to give near-Pentium performance at significantly lower costs (see chart page 20), the sources said. This will make the DX3, not Pentium, Intel's high-volume, high-performance chip through the first half of 1994. For current applications, Pentium will not give significant performance boosts over the DX3 until recompiled 32-bit software appears.

Price cuts expected

The sources said Intel is looking to price the 33-MHz/100-MHz chip near the $500 mark and will cut prices on the DX2 line when the DX3 is announced. Systems based on the 33/100-MHz DX3 could come in at close to current DX2 prices, which start at less than $2,500, according to sources at PC makers. Users could look for these chips to arrive as early as late this year, de-

Faster 486, *page 20*

Service, product gripes force Legent to fine-tune strategy after Goal merger

By Gary H. Anthes
VIENNA, VA

■ Almost one year after acquiring Goal Systems International, Inc., Legent Corp. is showing signs of some indigestion.

The company's new-license revenue is trailing expectations, its stock price has been bludgeoned, and a clique of users is claiming that service has slipped.

Some customers, especially those from the Goal side of the merger, also said they fear they will be left in the lurch as Legent merges its two systems management software product lines.

Most of the customers interviewed last week who had complaints said Legent had not done a good job of keeping them informed of the company's plans and progress.

Echoing that consensus, Legent President and Chief Executive Officer John Burton said the tradi-

Legent, *page 12*

Tandem line taking RISC on Mips chips

By Jean S. Bozman
CUPERTINO, CALIF.

Looking to shake the doldrums, Tandem Computers, Inc. is expected tomorrow to revamp its flagship line of fault-tolerant computers, repositioning them as RISC-based Unix-compatible servers.

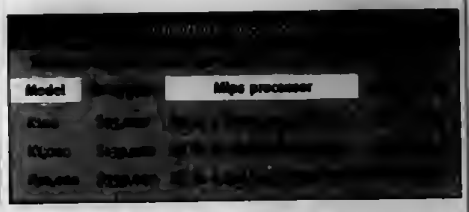
The introduction of the new line, called Himalaya, caps a four-year effort to open up the proprietary, fault-tolerant Guardian operating system, said Bill Heil, vice president of Tandem product marketing and product management.

But industry analysts said Tandem has moved too slowly on Unix, losing valuable time in migrating its user base away from Guardian. Some large Tandem sites said last week they were more interested in the prospect of falling prices for complex instruction set computing processors than in buying Unix RISC systems anytime soon.

One reason is that many longtime Tandem shops are still not convinced of the reliability of Unix-based transaction processing systems.

Tandem's move comes just a week before the $2 billion

Tandem, *page 8*



SUPER CIOS

Who makes the big bucks?

By Rosemary Cafasso

In 1982, James Marston was a vice president of data processing at AMR Corp., earning about $75,000 a year.

In 1992, his compensation package as chief information officer at American President Cos. in Oakland, Calif., was more than 10 times that amount when bonuses and the sale of stock from corporate programs were included.

Marston's story is not that unusual anymore. Several industry surveys show average compensation for CIOs

Super CIOs, *page 82*

American President Cos.'s James Marston says CIOs' salaries are driven by 'the CEO's attitude'

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■ **Tandem** is expected to announce that it is cutting overhead by basing its Guardian line on Mips RISC chips. *Page 1*

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■ **IBM** charts a comprehensive ATM course. Initial user reaction: "Show me." *Page 4*

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■ **Banyan's** communications server, to be released this week, will improve the link between IBM SNA and Banyan Vines networks. *Page 15*

■ **WordPerfect** makes a drive to capture a piece of fast-growing market for presentation graphics for Windows. *Page 16*

Ted Nelson

Quality improvement efforts *depend heavily on IS-driven changes. Bruce Spekhals is IS chief at the Ritz Carlton, where IS efforts helped the company win the Baldrige Award.* **Page 89**

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Executive Briefing

Not all CIOs earn stratospheric compensation, but many are proving themselves indispensable, especially in the quality arena. At the Ritz-Carlton (see photo) and building materials supplier Granite Rock Co., IS improvements in standards and data collection helped bag the Baldrige. *Page 89.* **And IS execs in the Des Moines, Iowa, area are more than earning their pay, trying to cope with a situation beyond the scope of any disaster plan — a city under water.** *Page 6*

A wave of another kind will soon hit IS, predicts Charles Babcock. Vastly more powerful PC systems with networking and client/server capabilities are going to place escalating demands on IS organizations, especially as more novices are logged on. *Page 37.* **And Esther Dyson sees a major challenge shaping up in the need to make training more accessible and continuous through on-line performance support.** *Page 33*

Compatibility and interoperability are the most pressing issues on many users' minds. Some are consolidating E-mail systems to avoid being swamped by compatibility and directory problems. *Page 59*

Positive news on the interoperability/integration front: The Frame Relay Forum's success in getting members to agree to a common way to wrap data communications protocols *(Page 59)*, **and the emergence of an active third-party community to serve the market for integrated, multivendor network management** *Page 64.*

Not so great news: Those who've been looking forward to using 100M bit/sec. Ethernet to relieve server congestion and ease distribution of large databases and image files may have to choose between competing standards. *Page 4*

The spirit of experimentation lives: Despite persistent problems with bureaucracy and red tape at national laboratories, progress is being made in fostering collaboration between these labs and private industry. Los Alamos is a leader with its Computational Testbed for Industry. Gillette is an active partner. *Page 28.* **Tandy is doing some testing of its own — employing wireless, pen-based, portable point-of-sale systems to eliminate checkout lines in its Incredible Universe superstores.** *Page 44.* **Denver International Airport provides a model of large-scale use of redundant fiber-optic cabling.** *Page 64*

"When we decided to downsize, I was pleasantly surprised to see that CA's a leading AS/400 software vendor. The fact that they offer the leading AS/400 manufacturing and warehouse software made it much easier for us. It's always better to go with somebody you already know and trust."

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Network data transfer

Fast Ethernet on duel course

By Lynda Radosevich

Users warily eyed last week's submission of two competing proposals for fast Ethernet, noting that similar but dueling standards could cause confusion and slow down migration to the 100M bit/sec. network technology.

"It could be good, depending upon what kind of flexibility you get, but more likely it will just be confusing," said Ken Hitt, a communications consultant at a major New England insurance firm.

Users said they were considering 100M bit/sec. Ethernet to widen networking pipes for applications including large database file transfers and image file transfers and to relieve congestion at busy servers. Faced with high-speed options such as Fiber Distributed Data Interface and emerging Asynchronous Transfer Mode, fast Ethernet's familiarity is appealing, they said.

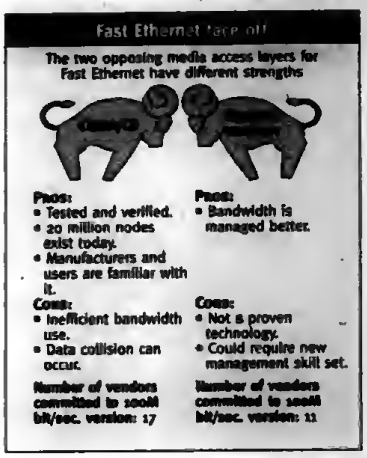
However, the competing proposals for 100M bit/sec. Ethernet will end up in different committees within the Institute of Electrical and Electronics Engineers, Inc., a move that would bring both to standards-status faster but would confer the Ethernet title to just the carrier sense multiple access/collision detection (CSMA/CD) proposal, said Charlie Robbins, director of communications research at Aberdeen Group in Boston.

That possibility has confirmed fears that vendors will not join behind one standard but will establish competing 100M bit/sec. Ethernet-type products.

Many observers said piloting two more Ethernet technologies on top of all the other options is too much. "It's getting to the point where you have to be a lawyer, run a testing lab and be an educator," in addition to being an information manager, Robbins said.

The main difference between the competing proposals lies in the media access control (MAC) layer of the Ethernet protocol (see chart). The first proposal, supported by 3Com Corp., Cabletron Systems, Inc., Grand Junction Networks, Inc. and 14 other companies, retains and "scales up" Ethernet's CSMA/CD MAC layer. This is the closest to traditional Ethernet and the method that users with limited technical staffs find more appealing.

For now, it is also the proposal with the most vendor support, a fact that also draws users. "Even if there is a technology that is a little bit better, I'll go where the other sheep are going because I've gotten burned before" by technology that lost favor among vendors, said LeAllan Estrem, a local-area network administrator at Capsule Environmental Engineering, Inc. in St. Paul, Minn.



The second proposal, headed by Hewlett-Packard Co. and AT&T and backed by Ungermann-Bass, Inc. and Proteon, Inc., departs from Ethernet's MAC by employing a method closer to Token Ring's token passing. This eliminates the potential for collisions of data packets but removes the familiarity factor.

Also, that departure draws questions as to how well the HP/AT&T proposal would "bridge" to 10M bit/sec. Ethernet. Bridging existing Ethernet to high-speed CSMA/CD versions will be straightforward because only one parameter is changed. "It is less clear with the HP solution how straightforward it will be" because all parameters but the Ethernet frame are changed, said John Payne, president of JLP Associates, a consultancy in San Jose, Calif.

Other differences include types of cabling supported. The HP proposal calls for four pairs of voice- or data-grade unshielded twisted-pair cable because it uses a "quartet" of signaling technologies that sends data on two wires and receives data on another two.

This requirement could hamper deployment of the HP technology. While more than a third of 116 companies recently surveyed had four or more pairs of voice-grade unshielded twisted-pair running to the desktop, many were using the cables for other purposes.

Wiring requirements for the CSMA/CD proposal have not been hammered out yet, but some vendors in that camp are leaning toward supporting a minimum configuration of two pairs of voice-grade unshielded twisted pair.

IBM hopes 'open' ATM will turn networking tide

By Joanie M. Wexler
NEW YORK

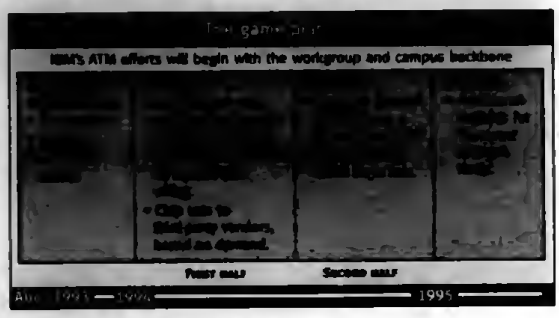
In a fresh attempt to run with the networking pack, IBM last week outlined a soup-to-nuts approach to delivering Asynchronous Transfer Mode (ATM) technology and migrating users to it gracefully.

ATM is an emerging high-speed technology for both local- and wide-area networking. Users are banking on it as a lasting next-generation network largely because of its ability to handle scalable speeds and efficiently bundle a mix of data, voice and video.

IBM's bet-the-business ATM product plan runs the low- to high-end gamut: chips, adapter cards, a switching module for its 8250 smart wiring hub co-designed with Chipcom Corp. and a wide-area ATM switch for both builders of private ATM backbones and carriers [CW, June 14].

Most observers agree that ATM represents IBM's big chance to recoup some business after missing windows of opportunity with key networking products such as multiprotocol routers and hubs.

"They've realized that in the last five years they've lost the networking battle; this is an opportunity for them to get back in the game," said Graham Morrison, a network design project leader at Blue Cross/Blue Shield of Connecticut, a large IBM system shop evaluating ATM products from IBM and others.



Morrison, who uses primarily Cabletron Systems, Inc. gear in his internetwork, said he has no problem with IBM's strategy as articulated but is concerned that IBM does not have an established track record as a network vendor. IBM also "charges dearly" to send staff out to help solve problems, he said, "which is why there is no IBM in my network today."

IBM has made "a lot of architectural announcements resulting in late products that weren't up to par," said Paul Callahan, senior analyst at Forrester Research, Inc. in Cambridge, Mass. "ATM is very important to them."

IBM's sweeping plan includes a few proprietary twists that some view as another myopic IBM ploy to control a chunk of technology in an era of openness. Others, however, point out that all vendors must innovate to compete.

For example, "every vendor with an ATM switch has to develop its own way for switches to talk to each other and to be managed," said David Passmore, a vice president at Gartner Group, Inc. in Stamford, Conn.

A key IBM "extra" includes its Broadband Network Services software architecture, designed to handle as-yet missing interoperability and congestion control functions in ATM networks.

The architecture came about because the ATM Forum, an unofficial standards body, "has done a fair amount of work on things like access, but there is no standard for one ATM node to talk to another," said Ellen Hancock, IBM Networking Systems' senior vice president and general manager.

IBM is also pairing ATM with a proprietary feature it calls Packet Transfer Mode (PTM) on a wide-area switch slated to ship in 1995 (see chart). The combined functions will allow the switch to evaluate incoming traffic and decide which mode of transport — ATM cells or PTM packets — is more appropriate given the traffic's characteristics, said William A. Bernstein, an IBM senior technical staff member

For example, if a transmission is mostly data, PTM will accept it, reformat it into variable-length packets sized according to the traffic type and "blast it through a high-speed network," he said.

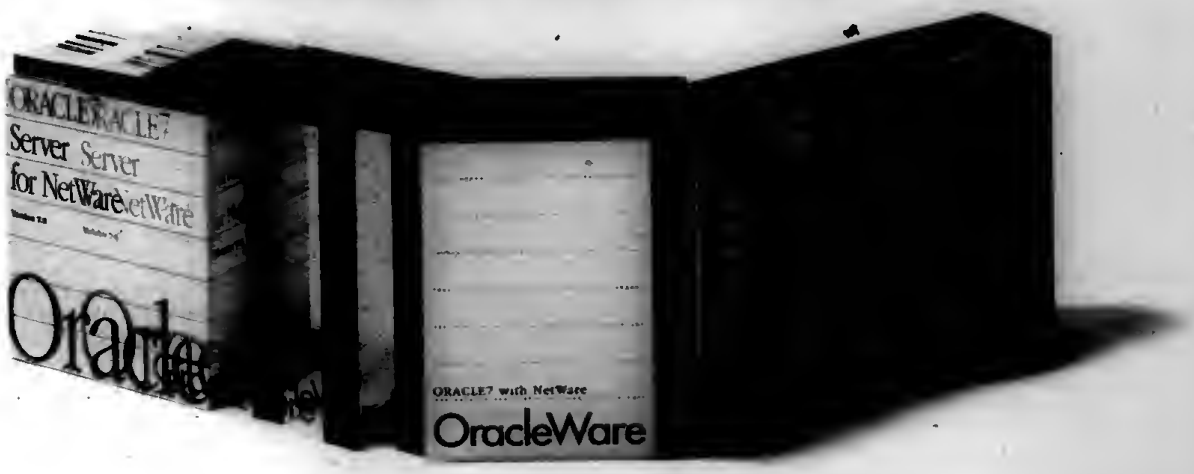
Speed considerations

Migratory innovations IBM has planned include under-100M bit/sec. adapter cards that run on unshielded twisted-pair wiring. Today, the ATM Forum is focused on 100M bit/sec.-and-up speeds over fiber.

ATM shopper Sam Schuler, communications strategy manager at Texas Instruments, Inc., said that "the closer you get to the workstation, the more important the media supported by the cards becomes." This is because many firms already have fiber in their backbones or have compelling financial reasons to install it there, he said.

All IBM ATM endeavors will go through the forum, Bernstein said. "We have learned our lesson with SNA: It was proprietary. With APPN, we tried to have a little of both. This one is going to be open."

ANNOUNCING A MAJOR STEP FORWARD IN ENTERPRISE-WIDE COMPUTING.



THE RIGHTSIZING CHALLENGE

In theory exploiting the economies of networked PC's while continuing to extract value from older larger systems is relatively straightforward.
In practice it is not. For a start, no single vendor can provide the optimal integrated software solution for managing information from the mainframe to the desktop. While distributed computing makes data readily accessible, it also accelerates the movement of data around the enterprise magnifying the level of complexity. And when a problem arises, figuring out which vendor to call can be a nightmare.

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News Shorts

Apple losses exceed expectations

Apple Computer, Inc. last week said expenses related to a recent corporatewide restructuring contributed to a third-quarter net loss of $188.3 million. The company took a charge of $320.9 million for cost reductions and layoffs of 2,500 employees. The size of the write-off and weakness of operating profit surprised some analysts. Revenue for the quarter ended June 25 was $1.86 billion, a 7% increase over the comparable period last year. Macintosh computer shipments were up 20% compared with the third quarter a year ago, Apple officials said. Apple also consolidated operations into five business units.

Drugstore chain signs with ISSC

IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary last week won a 10-year deal to migrate Clearwater, Fla.-based drugstore chain Jack Eckerd Corp. to a companywide client/server architecture. ISSC will gradually migrate operations, including point-of-sale systems, to a distributed platform during the next four years. The deal is valued at $320 million to $440 million.

Novell merges SNMP, NetWare worlds

Novell, Inc. last week released Version 2.0 of its NetWare Management System (NMS) software developer's kit, which contains interfaces that allow developers to build applications that manage NetWare environments but run on Unix-based Simple Network Management Protocol (SNMP) platforms. The NMS console has always been able to receive alarms from other SNMP-manageable devices.

AST rationalizes Tandy acquisitions

AST Research, Inc. said that positioning itself for the future is costing it today. The company expects its purchase of Tandy Corp. subsidiaries TE Electronics, Inc. and Grid Systems Corp. to cause it to lose an unspecified sum for fiscal 1993, which ended July 5. The company finalized the purchase last week, paying $16 million in cash up front, with up to $160 million more due on a three-year promissory note. Analysts said it is unclear whether AST can count on maintaining Tandy's market share. They said AST's real gain is Tandy's manufacturing operations, which will double AST's capacity and give it a plant in Europe.

A Unix triad forms

Amdahl Corp. said last week that it will work with Fujitsu Ltd. and ICL PLC to develop a common Unix computing environment. The effort was designed to ensure that Unix applications can run, without change, on all three vendors' machines by late 1994. Amdahl, which is partly owned by Fujitsu, sells the UTS Unix operating system for mainframes. UTS is based on Unix System V, Release 4, as is Fujitsu's UXP Unix. Fujitsu also owns 80% of ICL, which sells its DRS/NX desktop, midrange and mainframe Unix systems in Europe.

SHORT TAKES Joining a long list of consulting firms, Inference Corp., a software tools and consulting services company, last week said it is getting into the reengineering business with a practice headed by Robert Friedenberg, vice president of the company's consulting group.... Ottawa-based SHL Systemhouse Ltd. last week bought Nidak Associates, Inc., a 7-year-old privately held Toronto-based client/server and open systems services firm.... Computer Associates International, Inc. announced plans to port its CA-Unicenter systems management family of packages to the UnixWare operating environment.

More news shorts, *page 16*

Data dowsed in Midwest floods

Hot sites key to emergency recovery; long hours become norm

By Ellis Booker
DES MOINES, IOWA

This city's computers expired July 11 at around 6 a.m. after 8 feet of water filled the sub-basement of one of the capital's two main administrative centers. The resulting disruption to electrical power necessitated the shutdown of an IBM mainframe, the terminal network and the private-branch exchange located on the second floor.

"No one could have predicted that a river would swallow our Des Moines building," said DICO MIS manager Gary Smith. "You can try to anticipate all the contingencies, but you still need a way to restore service if a disaster strikes."

As of last Thursday afternoon, the mainframe was still down. "We didn't have a disaster recovery plan," said Jack Rich, administrator of data processing.

That was a familiar refrain heard throughout the flood-ravaged Midwest last week after unrelenting rains caused the Missouri and Mississippi rivers and their tributaries to overflow their banks, disrupting life throughout an eight-state region.

It was the worst flooding to wrack data centers since the Chicago flood of 1992.

Planning for an information systems disaster, observers said, rarely envisions a situation in which an entire city's infrastructure — like Des Moines' — comes to a halt.

"Our plans didn't anticipate the city being dropped," noted Terry Marksberry, chief information officer at Meredith Corp., an $800 million diversified media company and publisher of *Ladies' Home Journal* and *Better Homes and Gardens* that is based here.

Water shortage?

Ironically, the city's loss of drinking water was a key problem for data centers across Des Moines, according to a number of users. While many sites had brought in generators or were using restored commercial power early in the week, the lack of water meant many data centers could not cool off their mainframes.

One of two flood-related disaster declarations received last week by Comdisco, Inc., a disaster recovery services firm based in Rosemont, Ill., came from a financial services company that was unable to cool its computer equipment for that very reason.

The customer flew in on a chartered jet along with 1,000 pounds of computer tape, checked into Comdisco's Wood Dale, Ill., hot site at 5:30 p.m. Sunday and was back in full production by Monday morning.

Meanwhile, Comdisco competitor SunGard Recovery Services, Inc. in Wayne, Pa., also reported that two Des Moines customers, a bank and an insurance company, had declared disasters on Sunday and moved into recovery sites at SunGard's Atlanta and Chicago recovery centers, respectively. The insurance company moved back to Des Moines on Monday, after commercial power was restored.

In Minneapolis, an IBM Business Recovery Services hot site welcomed the IBM Application System/400-based applications of DICO Corp., a Des Moines maker of wheels and tires.

At least one Comdisco customer in Des Moines stayed put by devising a novel solution to the water problem.

"We put in a child's wading pool and used a pump to spray the compressors," said Lloyd Peterson, second vice president of information services at Principal Financial Group, an insurance concern and one of the state's largest companies.

Both the IBM Enterprise System/9000-class mainframes in Principal Financial's two downtown buildings were back in production and running at normal transaction capacity by Monday morning. "As far as our [terminal] users are concerned, it's business as usual here," Peterson said.

Hard days night

Still, the company's 1,000-person IS staff, divided into shifts of 250 to 300 people, was working overtime early in the crisis, putting in 24- to 36-hour shifts.

Long hours were also the story at Meredith. "Everyone is working 20-hour days," Marksberry said. Shifting its Sun Microsystems, Inc. server network — featuring Cisco Systems, Inc. routers and Cabletron Systems, Inc. hubs — to the remote location took a day, and Meredith was back on-line by Tuesday.

In addition, Meredith employees were able to telecommute from home into the server's outsourced mainframe, which is operated in Boulder, Colo. Usually, Meredith has 900 to 1,000 PCs and 250 Macintosh computers on its corporate network.

"It's not pretty, but it's working," Marksberry said.

Down to the wire-less

After last week's flooding knocked out the phone switch for Des Moines and drowned the police department's mainframe, communications prospects looked very bad indeed, said Sgt. Tim Cunningham.

To make matters worse, President Clinton visited the city, an event that "strained my very limited resources," said Cunningham, who is the police department's chief of staff.

The department had regional phone company US West install eight emergency phone lines and had the use of some radio channels, but both were jammed with emergency communications. That left no good way for the 10 communities, dotting around the outlying parts of the city that staffed in remote offices, to get the information they needed to make decisions.

In stepped wireless electronic mail as the answer to Cunningham's SOS. RAM Mobile Data sent the department 10 packages that included Hewlett-Packard Co. 100LX handheld computers, Ericsson GE Mobile Communications, Inc. wireless modems and RadioMail Corp. software for RAM Mobile Data's wireless packet data networks.

The department was just distributing the E-mail devices at press time, but Cunningham said the additional mode of communication, which is impervious to water, would be invaluable, especially for sending longer reports on water-level and force equations.

—Lynda Radosevich

Informix users say support still lacking

By Kim S. Nash
SAN JOSE, CALIF

Informix Software, Inc. users soaght proof last week that the vendor has cleaned ap support problems saeh as erratic bug fixes, unacceptable response time and inadeqaate technical advice.

A few dozen of the users participating in the second annual user conference here vented frustrations and offered suggestions for getting the company's sapport organization on track during a two-hour open forum with Informix executives. Although Informix revamped castomer service in August 1992, users reported little relief from problems that have dogged the company for years.

Several users said they were impressed that Informix was open to shoot-from-the-hip feedback about problems, but they were skeptical that the company could address all their concerns quickly.

"We canceled a $30,000-per-year sapport contract because we weren't getting anything from the technician that we couldn't do ourselves," said one aser who requested anonymity.

"I'll be honest with you. We have a lot of problems yet to soive, hut we're putting measares in place and have been for about a year," Jim Hendrickson, Informix vice president of customer services, told the group. "But, yes, we have a ways to go in some areas," he added.

The remedies range from separate maintenance releases to a hulletin board service to the establishment of a focused support group.

Finding fixes

Users interviewed at the conference said they were most concerned with bug fixes for the Informix OnLine and SE databases and various Informix tools. "I wish that instead of holding seminars talking aboat all the features to be included in products that aren't even out yet, they would get to work on hug patches," a longtime OnLine customer said.

Hendrickson told forum attendees that he is doing just that. The next major bug patches for Informix OnLine 4.1 and 5.0 are dae out by December, called 4.12 and 5.02, respectively. Until then, users can get emergency patches from Informix if the problems are severe enough to crash applications. Otber users have relied on word-of-mouth help from fellow Informix customers or resellers.

Release 5.02 will contain fixes for 120 hugs, Hendrickson said. "We're getting close to a stable offering of [Informix OnLine] 5.0," he said, adding that be anticipates having to distribute just one more maintenance patch.

However, Informix application development tools are a different story. Hendrickson said he is not as far along in addressing bugs in development tools as he is in database engines. "We're still a ways away," Hendrickson acknowledged. An eight-member team is working on fixes for Informix-4GL, he said.

Repairing every bug in every prodact is "incredibly expensive," Hendrickson said. "But now that we're out of a dark hole, we can . . . see what's left and decide whether it makes sense for us to do from a husiness point of view."

Among the changes Hendrickson has made are the following:

- InformixLink, a bulletin board service, is the formal mechanism for notifying users of bugs. PCs or Macintoshes can access the service 24 hours a day, but users of Informix's lower level support plans do not have access to the entire database of bugs. That access costs $500 more than the price of basic support plans.
- Technical support people have been split into layers of expertise, with routine calls going to a 50-engineer hub in Lenexa, Kan., and more intricate problems tackled by special three-person teams at headquarters in Menlo Park, Calif.
- More focused quality assurance processes during the product development cycle, instead of quick tests after the product is built.

Not all users have seen problems. Midwest Securities Trust Co. built a Unix-based customer service application without encountering a single bug, said John Dynkowski, manager of emerging technology.

IBM tweaks AIX, RS/6000 servers

By Jean S. Bozman
WHITE PLAINS, N.Y.

IBM continues to tinker with its RISC System/6000 Unix server lineup. Last week it announced a high-end unit, price cuts on its current high-end servers and related peripherals and the addition of several AIX modules.

Server price cuts ranged from 13% to 16% on high-end Models 97B, 98B and 580; prices on RS/6000 peripherals were trimmed 20% to 34%.

The latest adjustments to the RS/6000 line followed two major upgrades in February and May, which produced 16 new RS/6000 models.

"IBM is still a hot-and-heavy contender in the world of workstations as servers," said Rikki Kirzner, a principal analyst at Dataquest, Inc. in San Jose, Calif. She added that the most recent tinkering provides a price/performance increase designed to help IBM stay competitive.

IBM's new Series 300 Model 34H unit (see chart) replaces the 18-month-old Model 340.

IBM Powerstation/Powerserver (Series 300 Model 34H)

Price: $13,000

Available: Aug. 6, 1993

Includes:
- 41.6-MHz processor
- 16M to 256M bytes main memory
- 400M bytes to 4G bytes internal storage

Meanwhile, IBM released AIX 3.2.4, which the company said contains enhancements that should greatly reduce installation time and ease maintenance of distributed AIX systems.

"It's a big step in the right direction for what users want," said Dave Smith, a Unix analyst at International Data Corp. in Framingham, Mass.

Several AIX modules supporting distributed processing were released. They include the following:

- AIX CICS/6000, which was announced last September, will channel transactions between IBM mainframes and Unix workstations.
- AIX/DCE Threads/6000 facility was designed to handle multiple client requests for the same Unix server.
- AIX DCE Version 1.2 is IBM's first implementation of the distributed file services feature of the Open Software Foundation's Distributed Computing Environment. It will allow users to share files across an enterprise network.

Key to success

Users said the AIX enhancements were key to the successful operation of distributed RS/6000 systems. "They're going through some of the issues of managing this diverse and spread-out computing environment," said Robert Benmosche, executive vice president of administration, operations and systems at PaineWebber, Inc. in Lincoln Harbor, N.J. "The more we can make this [environment] seamless and robust, the less difficult it will be to operate." PaineWebber is installing some 500 RS/6000 servers nationwide for application trading purposes.

Industry observers said the AIX ease-of-use enhancements are a sign that IBM is heeding users' complaints about excessive downtime due to installation of software upgrades and maintenance releases. "AIX can take many, many hours to install, but they've pared it down," said Terry Shannon, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "They recognized it needs to be easy, particularly in response to [Sunsoft, Inc.'s] Solaris, which has about a 45-minute install."

Installing AIX upgrades has become time-consuming, some users said. "It [AIX] installs pretty quickly if you have a new processor," said Roy Dodd, MIS manager at The Good Guys, Inc., a West Coast electronics equipment chain in Brisbane, Calif., which uses several IBM RS/6000 servers.

SGI brings high-end graphics to masses

By Jean S. Bozman
MOUNTAIN VIEW, CALIF.

Silicon Graphics, Inc. (SGI) last week unveiled the Indy, its first attempt at a mass-market version of its graphics workstations.

The workstation, which features on-line videoconferencing and a graphical user interface, is set to compete against low-end Sun Microsystems, Inc. graphics machines and high-end Apple Computer, Inc. Macintoshes used for publishing and multimedia applications.

Besides the base Indy model, other family members include a low-end unit that costs $7,495 and comes with a 340M-byte disk drive, 16M bytes of memory and a 16-in. monitor; and a high-end unit for $15,495 that features a 100-MHz chip, 16M bytes of memory, a 540M-byte disk drive and a 16-in. monitor.

Indy's low price is a dramatic departure for SGI, which just introduced low-cost Indigo workstations for $18,000 [CW, July 12]. An entry-level Iris Indigo unit costs $7,000.

"They've been the technological leader in graphics, but they've been content to concentrate on the high-end graphics market," said Harry Conover, a research analyst at D. H. Brown Associates, Inc. in Port Chester, N.Y. "Their prices [had] put them out of reach of the 2-D graphics and CAD/CAM market."

The new Indy hardware, Conover said, will be a tough competitor in terms of both price and performance with low-end Sun, Hewlett-Packard Co. and IBM RISC System/6000 workstations.

Base price: $7,500 **Available:** Third quarter 1993

Features:
- Diskless configuration includes Mips R4000 chip.
- 16M bytes of main memory.
- Lightweight color video camera made by Teleview Research in Palo Alto, Calif.
- 25-in. color monitor.
- 24-bit color graphics, keyboard and mouse.
- Disk and upgrade options could boost price to nearly $8,000, industry analysts said.

Some observers said they see Indy as a wedge to gain market share from another strong competitor in the graphics market — Apple, which is due to introduce its PowerPC by 1994.

"A lot of graphic artists are hoping to move from the Apple Quadra to the PowerPC, so SGI is making a preemptive strike there," said Tony Bove, a publishing and multimedia software analyst who edits the "Inside Report on New Media" in Gualala, Calif. Due to their unfamiliarity with using Unix commands, Bove said, such users have found SGI workstations difficult to operate. But SGI said Indy's new icon-based interface will hide the Unix command line.

Applications software is another concern. "There's no doubt the SGI graphic engine is excellent," said Paul McGuckin, an analyst at Gartner Group, Inc. in Stamford, Conn., who questioned the availability of compatible shrink-wrapped applications. SGI said about 1,300 SGI-compatible applications can run on the machine, along with a Windows emulator from Insignia Solutions, Inc. and a Macintosh software translator from Quorum Software, Inc.

Tandem line

CONTINUED FROM PAGE 1

firm plans to detail a restructuring plan [CW, July 12]. The company said it expects to post a loss for its third fiscal quarter.

Early last year, slow sales and a 5% growth rate forced Tandem to restructure; it reduced its work force by 6%. The company said it could not comment on its latest restructuring plan until July 28.

The newly restructured Tandem, which builds fault-tolerant systems used in banks and telephone companies, will base all its systems on Mips Technologies, Inc. reduced instruction set computing (RISC) chips. That will reduce its overhead, which should boost profits, Tandem said.

However, Tandem will continue to sell its non-RISC Cyclones, once priced at more than $1 million, Heil said. Tandem introduced its first CLX/R and Cyclone/R RISC servers in October 1991.

One immediate payoff from the new RISC systems has been substantial discounting of the Cyclone systems, users said.

New York's Coffee, Sugar & Cocoa Exchange just bought six Cyclone models for roughly what it paid for two Cyclones in 1990, said Patrick L. Gambaro, senior vice president of system floor operations at the exchange. Discounting of the Cyclones may be linked to Tandem's desire to clear the decks for the new machines, he said.

"We think Tandem is trying to promote the new products and to do it quickly, to try to turn the company around," Gambaro said.

Keeping it in mind

Some users said they liked Tandem's strategy to move to open systems, but they have no immediate plans to buy the new NonStop Himalaya design.

"Our current plan is to continue to utilize the resources we have, but we are looking at the opportunity to migrate to open systems platforms," said Don Karmazin, vice president of information systems at the Chicago Board of Trade, which has eight Tandem VLX systems. "It will certainly be something to be considered."

Tandem's Himalaya boxes will range from low-end $25,000 data servers to a massively parallel system with a base price of $339,000. At the same time, Tandem is giving users the option of placing either a Guardian or Posix "personality" on top of the basic fault-tolerant Guardian operating system.

"The personality adapts the application to the transaction service, which is our underlying technology in the [Guardian] kernel," Heil explained. In time, Guardian will only have "open" personalities, he said, but Tandem's only Unix System V Release 4-based system will continue to be its Integrity line of Unix RISC systems.

A separate Tandem partnership with Unix System Laboratories, Inc. (USL) will develop a version of USL's Tuxedo on-line transaction processing monitor optimized for massively parallel servers and fault tolerance. That software code should be available in late 1994, Heil said. A Posix developer's kit is set to ship in December.

Tandem's solution may not be all-Unix yet, but it is headed in that direction, analysts said.

"It's a building-block approach to provide what amounts to a fairly comprehensive Unix environment, but one that still has a Tandem flavor," said George Weiss, vice president of Gartner Group, Inc.'s midrange computing strategies service in Stamford, Conn.

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Windows NT client first piece to solve 32-bit puzzle

By Michael Vizard
SEBMOND, WASH

While information systems directors await the fall shipment of NT Advanced Server, developers said this month's expected delivery of Microsoft Corp.'s NT client will be the first stable 32-bit platform capable of building next-generation Windows applications.

Although Microsoft has shipped 50,000 Win32 development kits, developers have generally been waiting for Microsoft to provide a stable platform on which they can really hammer out the intricacies involved in creating 32-bit applications, said Bill Cornfield, president of the Windows Support Group, a systems developer in New York.

"I'm bullish on NT as a technology, but real life is real life, and Microsoft has to start delivering something other than merchandising," said John Dunkle, president of WorkGroup Technologies, Inc. in Hampton, N.H.

According to Cornfield, his organization will make use of the NT client to create native NT applications that will run primarily on the server, with some of those applications also running on NT clients. In addition, Cornfield said he views the NT client as a platform for developing 32-bit applications that will run on Windows 4.0, also known as Chicago, which is due sometime next year.

On the fence

As yet, Cornfield said it is too early for him to tell whether his organization will lean toward NT clients or Windows 4.0 clients, but Dunkle maintained that because NT "consumes a horrendous amount of system resources," most sites will opt to deploy 32-bit applications on Windows 4.0 clients [CW, June 28].

"I'm sitting here running NT on a Dell 66-MHz 80486. It takes up about 125M bytes of disk space, which on this system leaves me with 16M bytes of free memory space," Dunkle said.

Because of these issues, Dunkle said developers are currently "cooling their heels on NT" while they wait to get a look at Chicago. "The road to Cairo may actually be through Chicago rather than NT," he said.

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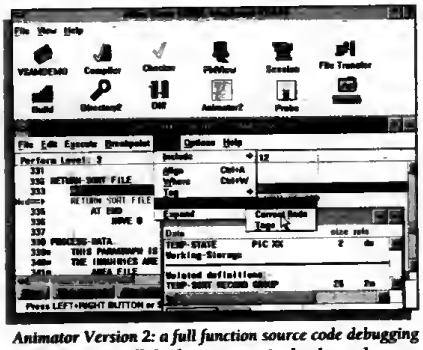

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Service, product gripes force Legent to fine-tune

CONTINUED FROM PAGE 1

tionally mainframe-centric company had erred in not better publicizing its strategy and architecture for non-MVS platforms. He said Legent will reveal by the end of September "a very clear template" for its role in distributed computing in terms of "architecture, product deliverables, mergers, acquisitions and affiliations."

Burton also blamed a revenue shortfall on a shift in focus by the sales force that had inadvertently neglected smaller customers (see story below).

Legent CEO John Burton *acknowledged that a clearer product strategy is needed*

Despite Burton's admissions, other users said they remain completely satisfied with Legent's service and are confident it is making the right product moves for the future.

Merger results

Still, the merger has had some unforeseen and unfortunate by-products. Legent recently decided to abandon development of OPS/View, a PC-based product for consolidating MVS message traffic from multiple systems into a single intelligent display. OPS/View was in use at a number of beta-test sites.

Suzanne M. Nicastro, vice president of Legent's Data Center Management group, said Legent decided not to complete development of OPS/View, which Goal had started before the merger, because its capabilities would ultimately be in the new "superset" automation workstation product.

Sarah Reinemeyer, supervisor of systems engineering at Texaco, Inc., and a beta-test user of OPS/View, said she was counting on it to allow remote management of MVS data centers from a local-area network. She said she cannot wait for the superset product. "We are going to go and get somebody else's product, and Legent is missing the market," she said.

Donlen Ruffin, automation project leader at Tandy Corp. and a user of the Goal OPS products, said he is worried he will lose capabilities when the superset products appear. "Back and forth, back and forth, we seem to get conflicting stories from Legent about their product plans," he said.

On the day after the Legent/Goal merger became final last August, Legent announced a plan for developing "superset" products in two areas — automated operations and output management — incorporating the best features of similar products from Legent and Goal. Legent said it would bring out new releases of the separate Legent and Goal products in 1993, then introduce superset products 12 to 24 months later [CW, Aug. 17, 1992].

Superset commitment

Nicastro said last week the company has not backed away from its commitment to give users a smooth migration path to the superset products while ensuring no loss of existing capabilities.

She said that although some release dates have been moved back, that has been offset by the fact that the releases will contain more features than had originally been planned. To overcome past communications shortcomings, Legent recently sent customers the first of a planned series of progress reports on the superset products, Nicastro said.

Support gap

A number of users said technical support for the Goal automated operations product line had slipped since the merger. "Support is not as good [or quick] as it used to be," said Earl Harper, senior automation analyst at Visa International, Inc.

"With Goal, technical support was never the best, but now they don't seem to have a personal interest anymore," Ruffin said. When he called a technical support supervisor to complain about poor service, he had to leave three messages over a 10-day period before his call was returned, he said.

Reinemeyer, who is also chairwoman of OPSXchange, the national Legent user group for OPS, said she had been told Legent would not promise to resolve all customer problems with OPS unless they were deemed serious. "I don't recall that happening before, but it's been happening more and more during the past six months," she said.

David Boast, Legent's vice president for client services, strongly disputed the claim that support for OPS out of the company's Woodland Hills, Calif., office had slipped. He said detailed reports that track statistics such as problem-resolution times and number of outstanding problems showed no deterioration in the past 12 months.

Customers on the Legent side of the Legent/Goal merger appeared happier with service. "Service is their strong point," said Nathan Gillison, operations software specialist at South Trust Data Services, the data processing arm of South Trust Corp. in Birmingham, Ala. He said response to trouble calls is usually "right then and there, even if the problem is not critical."

South Trust uses AutoMate/XC and AutoMate/MVS — automated systems operations products from the Legent side of the house — and plans to become a beta-test user for the superset PC product. Gillison said he is completely satisfied with what he has heard from Legent about its product development plans.

"Legent has always made me happy. If I had something that was not quite right, they made it right. I don't trust software companies in general, but over the years Legent has earned my trust," Gillison said.

Boast disputed several customer views that support for the OPS products had been reduced. "The OPS [Goal] and Automate [Legent] support staffs have both been maintained since the merger," he said. "They are the same teams, have the same managers, the same locations and same phone numbers."

In addition, Boast said, Legent had improved service in a number of ways, including extending call hours and implementing a faster process for complaints.

Up and down

Not working

- Synergies from the Legent/Goal merger (the "superset" products) have not yet emerged. Some users are confused about company's direction.
- Some Goal products — tape management and backup/recovery for MVS — had to be reworked.
- Legent is late with some products, such as a software distribution tool.
- Sales force has focused on customers' "big picture," not individual products, resulting in some missed sales.

Working

- Company is profitable, has ample reserves and low debt.
- Several major product development efforts are completed or nearing completion.
- Software for systems management is expected to be a booming market.

Hard lesson learned

[illegible] may have given Legent a mixed report [illegible], but Wall Street was not [illegible] knocking 40% off the company's [illegible] in the two days following an [illegible] Burton, president and CEO, [illegible] Standard Bank analysts were [illegible] the shortfall in Legent's [illegible] Legent's [illegible] products [illegible] other outlined from a major [illegible] Bank Securities that gives that [illegible] for a single high-[illegible] management who could help [illegible] adapt enterprise-wide computing strategies.

"The downside was we didn't have enough people addressing the technical levels where people would use one or two of our products in day-to-day tactical activities," Burton said.

"The mainframe market is slowing down, and Legent hasn't laid out an architecture or a coherent strategy for the PC-LAN-Unix area, other than bits and pieces," said Dale Kutnick, president and research director of META Group, Inc. in Westport, Conn. "That is still lacking, while their major competitor [Computer Associates International, Inc.] has articulated that."

According to Kutnick, Legent is strong financially. He predicted it will pull out of the doldrums in the next quarter or two as it reassures customers and investors that it is on the right track.

—Gary H. Anthes

Portable document format bows

By Michael Vizard
ALAMEDA, CALIF.

Farallon Computing, Inc. plans to launch an assault against Adobe Systems, Inc. with this week's release of a portable document file format that is linked with TrueType fonts developed by Microsoft Corp. and Apple Computer, Inc.

Called Replica, the Farallon file format works primarily with applications that use TrueType fonts. It was designed to allow users to send documents that can be viewed on any Windows or Macintosh system. This technology is a counter punch to the Acrobat portable document file format delivered last month by Mountain View, Calif.-based Adobe [CW, June 14].

Replica, however, differs from Acrobat in one key area. Acrobat requires sites to have a copy of Acrobat Exchange software, which converts a file into a portable file format, and each user who wishes to access those files must have a copy of Acrobat Viewer.

In contrast, Farallon's approach gives users the option of creating a portable document using Replica Creator and then shipping a copy of its Replica Viewer software along with that document. This eliminates the need for each user to have a copy of a viewer installed on his desktop.

Farallon said it will be able to compete against Adobe because most business users today are using the TrueType fonts that come bundled with their applications.

In contrast, Adobe executives said Acrobat works with both Adobe and TrueType fonts. In addition, they noted that Acrobat currently works across Windows and Macintosh platforms, with support for DOS and Unix due later this year. Farallon's Replica is currently available for Windows, but the Macintosh implementation will not be available until the fourth quarter.

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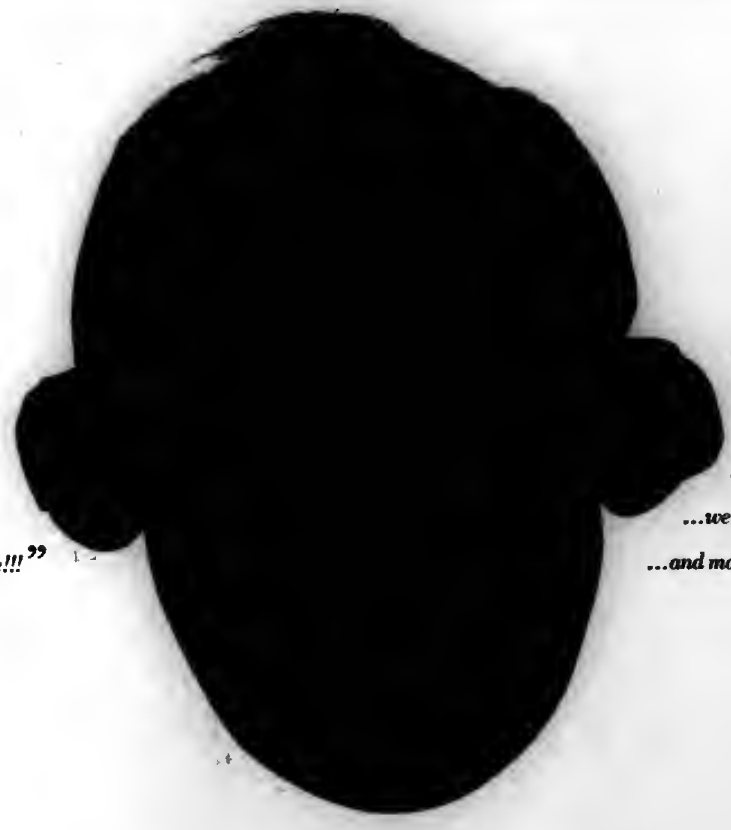

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UnixWare, NetWare blend questioned

By Melinda-Carol Ballou
SANTA CLARA, CALIF.

While Novell, Inc. touts an alliance with Cygnus Support as a means to help unite UnixWare and NetWare, there is some skepticism in the industry about its ability to do so.

Announced here last week, the agreement with Cygnus to deliver Gnu Not Unix (GNU) Unix-based tools for cross-platform development of NetWare Loadable Modules (NLM), as expected, underscores Novell's drive into the operating system wars with Microsoft Corp.

Through the technology alliance, the two companies will enhance the Unix-based GNU C and C++ language development tools, including compilers and assemblers and a source-level debugger. Plans are to ship an NLM software developer's tool kit by the second quarter of 1994, officials from both companies said.

The alliance will not only bring popular Unix tools to NetWare, offering a consistent development environment, but it will also bolster Novell's work to integrate UnixWare and NetWare, officials said.

Cygnus offers a single compiler that will allow the NLMs to run across 80386-based PCs, Sun Microsystems, Inc.'s SPARCstations and Digital Equipment Corp.'s Alpha and Hewlett-Packard Co.'s Precision Architecture-RISC workstations. The compiler is implemented as a front end that is language-specific and will ultimately support Fortran and Ada in addition to C and C++, officials said.

"Ninety percent of the compiler's code is common across platforms; the [remaining] machine-specific code is compiled into specific binary images," Cygnus President Michael Tiemann said. "In the case of processor-independent NetWare, there will be four separate binaries, each of which will be hosted on UnixWare and will generate code for a specific platform."

At the API

Novell will begin its integration work for Unix and NetWare at the application programming interface level, according to Willie Tejada, director of developer relations at Novell. "Most commonly, people ask us, 'When will I be able to author an application that can run in both NetWare and UnixWare as an NLM?'" he said.

He added that the biggest challenges in uniting two such dissimilar environments include surmounting different execution models and operating subsystems. "We want to provide integration without devaluing either [UnixWare or NetWare], and Cygnus will provide us with the [cross-compilation] tools to help do that," Tejada said.

Industry analysts, however, were skeptical about Novell's ability to unite the operating environments. "Both operating systems have entirely different characteristics.... NetWare is unprotected and has no [comparable features such as] paging. There's no way that you can take [a Unix application] and design it and have it run well under NetWare without an enormous number of changes," said Rich Finkelstein, president of Performance Computing, Inc., a consultancy in Chicago.

Distributed networks

Novell leads client/server security effort

By Thomas Hoffman
NEW YORK

Ceding to customer demands for mainframe-level security in distributed network environments, Novell, Inc. is leading a group of vendors and users to bring international standards compliance to its NetWare 4.0 network operating system and related products.

NetWare compliance with the European Commercial Licensed Evaluation Facilities E2 and the National Computer Security Center C2 evaluation processes and standards will take 12 to 24 months, respectively. C2 includes identification and authentication, discretionary access control, audit and object-reuse functions. E2 is the European corollary.

Novell's effort is called Trusted Network Computing Environment (TNCE). It will consist of a suite of security software under development by third parties, such as Raxco, Inc., Cordant, Inc. and Semaphore Communications Corp., that comply with the C2 and E2 standards.

"Just the fact that you have Novell spearheading a large group addresses some big holes in network security," said Robert Kane, a computer security expert at Intrusion Detection, Inc. in New York.

Nearly all of the dozen or so vendors that have endorsed TNCE — including AT&T and Computer Associates International, Inc. — offer NetWare-compliant security tools. However, certification of a suite of network security packages will for the first time allow these technologies to interoperate with one another.

Customers would be able to pick and choose between packages in the TNCE suite to best meet their organization's network security needs. And unlike other security offerings that provide only partial network protection, the Novell TNCE suite will encompass the entire network, including workstations, servers and all other components.

"It's a 'Good Housekeeping Seal of Approval' on a product set more than anything else," noted Kurt Seibert, CA's senior vice president of strategic business alliances.

The waiting game

Users said they would likely wait until TNCE products emerge before entrusting mission-critical data to insecure local-area networks.

"We're planning to implement EDI for electronic trading [on a Novell network], but we won't do it until the technology [security] is there," said Brian R. Gladman, a procurement executive at the UK's Ministry of Defence.

Robert Young, Novell's vice president of marketing for NetWare systems, said pricing for the C2- and E2-certified NetWare products would be consistent with current price structures for NetWare and attached products.

Expert opinion

[illegible]

NetWare pushes out quick 4.0 fix

CONTINUED FROM PAGE 1

noting they expect NetWare 4.0 to make up 15% of NetWare revenue in fiscal 1993. Novell shipped more than $40 million worth of NetWare 4.0 in the first quarter, said Darrell Miller, Novell's executive vice president.

Users cautious

However, resellers and distributors said the product has been slow to move off the shelf. "Users are studying it, but there's not a lot of serious interest in installing it," said Dudley Larus, a marketing manager at Syntrex Technologies, Inc., a nationwide systems integrator based in Valley Forge, Pa.

Larus and Finnie said users are cautious. "Many people running mission-critical applications just will not go to 4.0 until it has been pounded on for a year," Larus said.

Many users said the new fixes and enhancements are not enough to overcome a reluctance to spend money and disrupt local-area network environments.

"I'm reluctant to upgrade for two reasons: First, NetWare 4.0 is expensive [$15,695 for a 250-user version], and second, I've spent two years getting my NetWare 3.11 LAN up to 99.9% reliability, and I'm leery of screwing that up," said Patrick Carney, director of information systems at Asea, Brown, Boveri in North Brunswick, N.J.

Source: The Burton Group, Salt Lake City

The major enhancements to NetWare 4.01 center on NDS, which now has faster synchronization, greater scalability, better internetworking support and self-repairing capabilities.

However, NDS is still not backward-compatible with the server-centric, bindery-based user and directory structure found in NetWare 2.x and 3.x. So network managers must either upgrade all their servers to 4.0 at once or struggle with two completely different user management schemes.

Finnie insisted that complete interoperability does exist today. What Novell has yet to do, he explained, is to hook enough services into the bindery service to enable users to view the network as one entity rather than as individual servers. As a result, network administration under 4.0 is somewhat limited today, he added.

While Novell promises to provide tighter bindery/directory integration in future releases, many impatient users are looking at Banyan Systems, Inc.'s Enterprise Network Services (ENS) for NetWare as an interim solution [CW, July 12].

"ENS will run across both NetWare 3.x and 4.x; so many users, who want global directory but are leery of upgrading, are putting ENS on their 3.x networks now, figuring that it will ease their eventual upgrade to 4.0," said John Krick, an analyst at DataPro Information Services in Delran, N.J.

Included in NetWare 4.01 are new versions of the VLM, which Novell touted as a more powerful client that could be custom-configured and loaded into high memory.

User gripes

Users have complained vociferously on CompuServe bulletin boards about poor performance, corrupted data and unstable drive mappings in NetWare 4.0's VLMs — problems Novell says it fixed in the VLMs shipped with NetWare 4.01.

NetWare 4.01 also contains support for OS/2 graphics and a five-user version of Novell's NetWare for Macintosh 4.0 product.

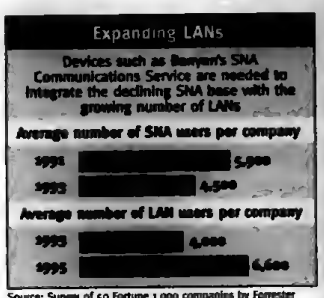
NetWare 4.01 will automatically ship to registered NetWare 4.0 customers. Because it is not backward-compatible with 4.0, Novell officials urge users to upgrade all servers simultaneously.

Banyan improves SNA links

By Lynda Radosevich
WESTBORO, MASS

Banyan Systems, Inc. this week will expand client support for software that allows users running terminal emulation on its Vines networks to access IBM hosts.

SNA Communications Service, client and server software based on technology from Digital Communications Associates, Inc. (DCA), provides 3270 emulation capabilities to PCs running DOS, Windows and OS/2. Client software that works on Macintosh computers will ship in the first quarter of 1994, and support for Microsoft Corp.'s Windows NT will follow at an unspecified date, a Banyan official said.



Source: Survey of 50 Fortune 1,000 companies by Forrester Research, Inc., Cambridge, Mass.

The SNA Communications Service is also integrated with Banyan network services, such as the StreetTalk directory and security and management features.

The server software is a big improvement over an earlier Systems Network Architecture (SNA) gateway from Banyan that supported only DOS clients, said Richard Schaefer, vice president of client/server technical services at Shawmut Bank in Hartford, Conn.

The bank uses the server to give access to data in three IBM 3090 mainframes to roughly 1,000 Vines end users on multiple platforms.

"The main benefits are faster file transfers and more users supported per server," Schaefer said.

Also, the SNA Communications Service helps Shawmut link IBM resources to the Vines' StreetTalk directory so end users can access SNA sessions using standard Vines commands.

The server software resides on Vines for The Santa Cruz Operation SCO Unix server and includes support for SNA protocols and development tools, including Advanced Program-to-Program Communications (APPC) and DCA's Universal Communications Architecture.

Shawmut is using APPC and the Banyan communication server with Legent Corp.'s X.Com LU6.2 client software to build an application that automates file transfers and distributes software. Neither the previous Banyan gateway nor DCA's Vines-to-SNA gateway would let him do that, Schaefer said.

Pricing starts at $2,995 for server software and $2,795 for 10 client workstations.

Server games

SNA Communications Service puts Banyan on a par with Microsoft Corp.

Microsoft already leverages DCA's terminal-emulation technology to link multiple clients to its LAN Manager terminal-emulation server, said Todd Dagres, an analyst at The Yankee Group in Boston.

However, Microsoft plans to step ahead by moving its SNA server to the Windows NT platform three months after NT's expected late summer ship date. The server will feature advanced security features that are built into NT [CW, April 12].

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News Shorts

Kaleida's changing CEOs

Kaleida Labs, Inc. appointed Michael Braun, a 20-year IBM veteran, to succeed Nat Goldhaber as president and chief executive officer of the Mountain View, Calif.-based firm. Goldhaber will remain as co-chairman of the board, while Robert Carberry, president of IBM's Fireworks Partners, will continue as Kaleida's other co-chairman. Goldhaber, a former venture capitalist, indicated his days at Kaleida might be numbered, saying he is looking into creating start-ups that use some of Kaleida's emerging technologies. Kaleida is trying to create cross-platform multimedia products using its ScriptX scripting technology.

HP rings up net management system

Hewlett-Packard Co. this week will ink a deal with **Bell Canada** to help develop a Unix-based network management system for the Canadian telecommunications giant. The $1.5 million job calls for HP's Professional Services Organization to develop and implement a network control center based on the HP 9000 Series 800 minicomputer. Separately, HP has disclosed an agreement to bundle BGS Systems, Inc.'s Best/1 capacity management tools with its own Performance Collection Software.

Feds lift CSC unit bidding ban

Computer Sciences Corp. (CSC) late last week agreed to pay $2.1 million to the **Department of Justice** and the **Environmental Protection Agency** (EPA) to resolve allegations that it had overcharged the EPA in the 3-year-old technical and operational services contract. The settlement lifts the federal government's suspension of CSC's Applied Technology Division, clearing the way for that unit to again bid on government contracts. The action eliminates lingering questions that incumbent CSC would have been ineligible to compete again for the Air Force's Eastern Range Technical Services megacontract, which was due to be awarded after press time last Friday.

Development jump starts from Oracle

Oracle Corp. announced Oracle Industries, a combination of consulting, development tools and business models geared toward specific vertical industries. Initial targets include utilities, oil, higher education and pharmaceuticals. The combination products save users between 20% and 40% of the work of re-engineering and building large systems, Oracle claimed. Programs for financial services and other areas are in the works.

Wireless users to test RF phone services

MCI Communications Co. and **Northern Telecom, Inc.** said they will team, starting next month, on a 90-day trial of personal communications services using radio frequency technology. Participants in the Richardson, Texas, and Washington, D.C., areas will test wireless phone services that let them answer, route or screen calls and allow them to conference colleagues.

SHORT TAKES **Fujitsu Ltd.** has decided against buying a license to use the latest versions of IBM system software. This represents the first time in the almost-decade-long legal wrangle between the two companies that Fujitsu has not bought rights to IBM software.... **Epoch Systems, Inc.** in Westboro, Mass., said it is porting its backup, file migration and volume and library management software to HP's line of Unix computers.... **Hitachi Ltd.** said it will incorporate HP's SoftBench Unix-based application development framework into its computer-aided software engineering products.

Desktop graphics heat up

WordPerfect ups ante vs. Software Publishing, Microsoft

By Michael Vizard
OSEM, UTAS

WordPerfect Corp. served notice with last week's delivery of WordPerfect Presentations 2.0 for Windows that it is finally set to do battle for its piece of the highly contentious presentation graphics software market.

With the arrival of its first presentation graphics package for Windows, WordPerfect is now poised to make a play for the fastest growing segment of the Windows software market (see chart below). Driving this growth is the fact that presentation graphics packages are substantially easier to use in a Windows environment than they are on DOS platforms.

However, this surging market has already been targeted by market leaders such as Microsoft Corp., Lotus Development Corp. and Software Publishing Corp. To compete, WordPerfect intends to leverage the tighter file compatibility between its presentation graphics package and its widely used namesake word processor.

In addition, WordPerfect will rely heavily on features that are more often found in drawing packages such as CorelDraw from Corel Corp. For example, WordPerfect Presentations 2.0 offers a full bitmap editor and an autotrace capability that converts files into vector images, which are high-end drawing features that are not currently found in other presentation graphics packages.

WordPerfect is also bundling a scanner with WordPerfect Presentations at no extra charge for the next three months. Other major features include support for Microsoft's Object Linking and Embedding 1.0, support for still video images and CD-ROM sound.

WordPerfect Presentations 2.0 *has a bitmap editor and an autotrace capability that converts files into vector images*

WordPerfect users, meanwhile, reported that file compatibility between the Windows and DOS versions of presentation graphics packages, which WordPerfect provides, ranks highest on their list of priorities.

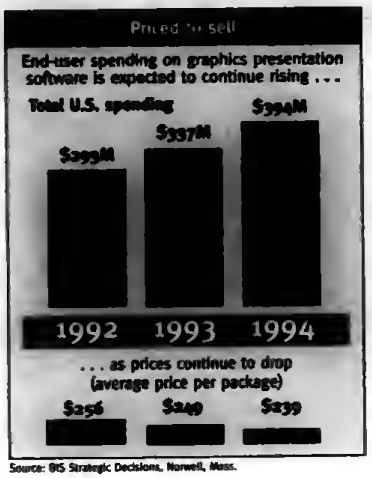
"The WordPerfect strategy seems to be to make DOS and Windows look similar," said Sherman Robinson, a senior economist at the Council of Economic Advisors in Washington, D.C. "Since I'm forced to go back and forth across platforms a lot, it's nice to have a product like Presentations."

Because WordPerfect Presentations supports multiple spreadsheet formats, it is also easier to move spreadsheet files into the WordPerfect graphics package than it is to move other packages, Robinson added.

But while WordPerfect has made a strong entry into this market, the company's Achilles' heel in selling graphics software remains its lack of a true suite offering to combat Lotus and Microsoft. Software Publishing, which is the dominant supplier of presentation graphics packages in the DOS market with its Harvard Graphics package, faces a similar problem.

"Suites are so popular today that WordPerfect may not have enough leverage. We estimate that one out of every two sales of Microsoft's PowerPoint package is tied to its suite," said Bill Henning, an analyst at BIS Strategic Decisions in Norwell, Mass.

In the long run, Henning said he expects that WordPerfect will ultimately make a reasonable showing in this market by leveraging its word processing customers. But he said he doubts Software Publishing's ability to compete in the long term after failing to respond quickly to Microsoft's initial launch of PowerPoint under Windows.



Source: BIS Strategic Decisions, Norwell, Mass.

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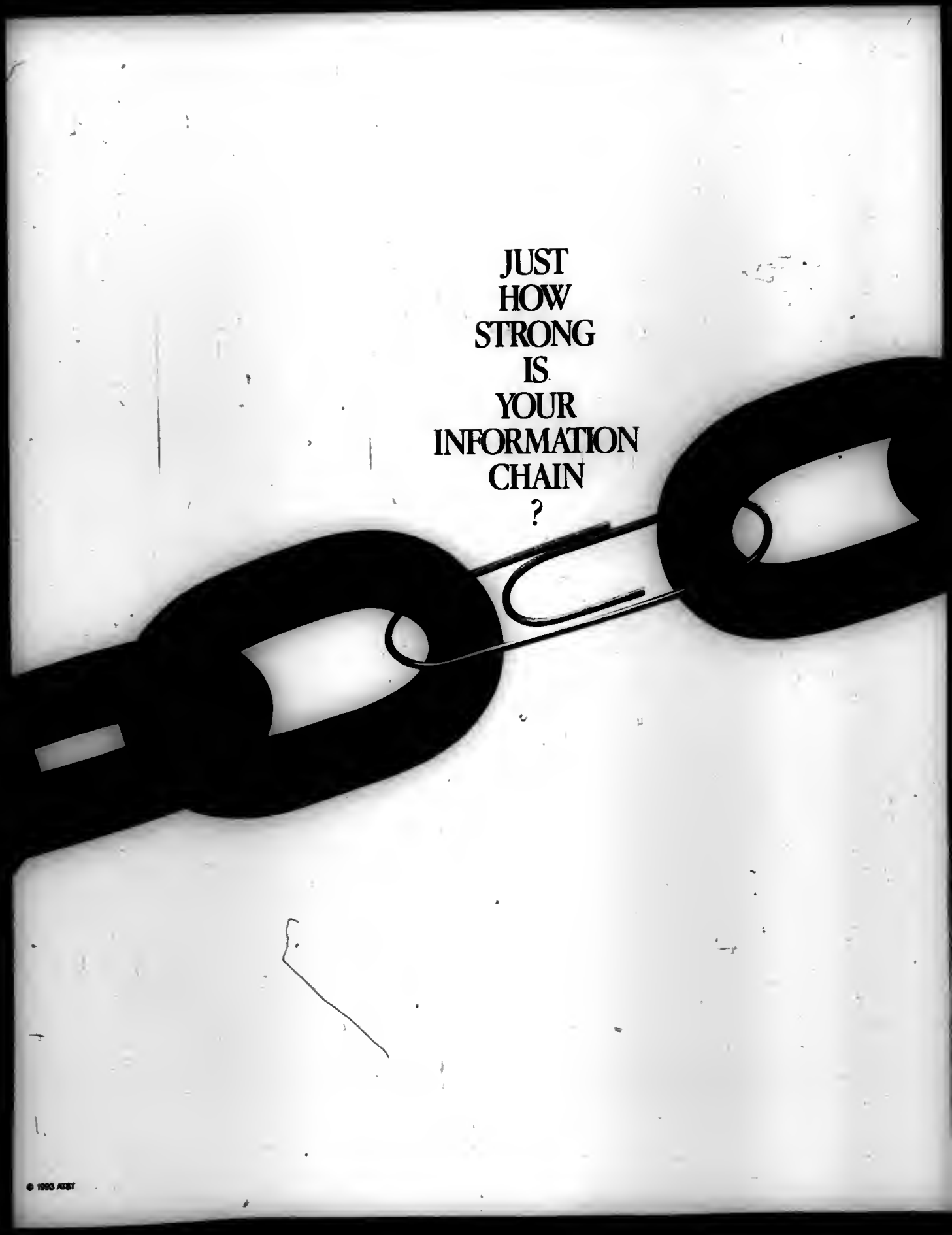
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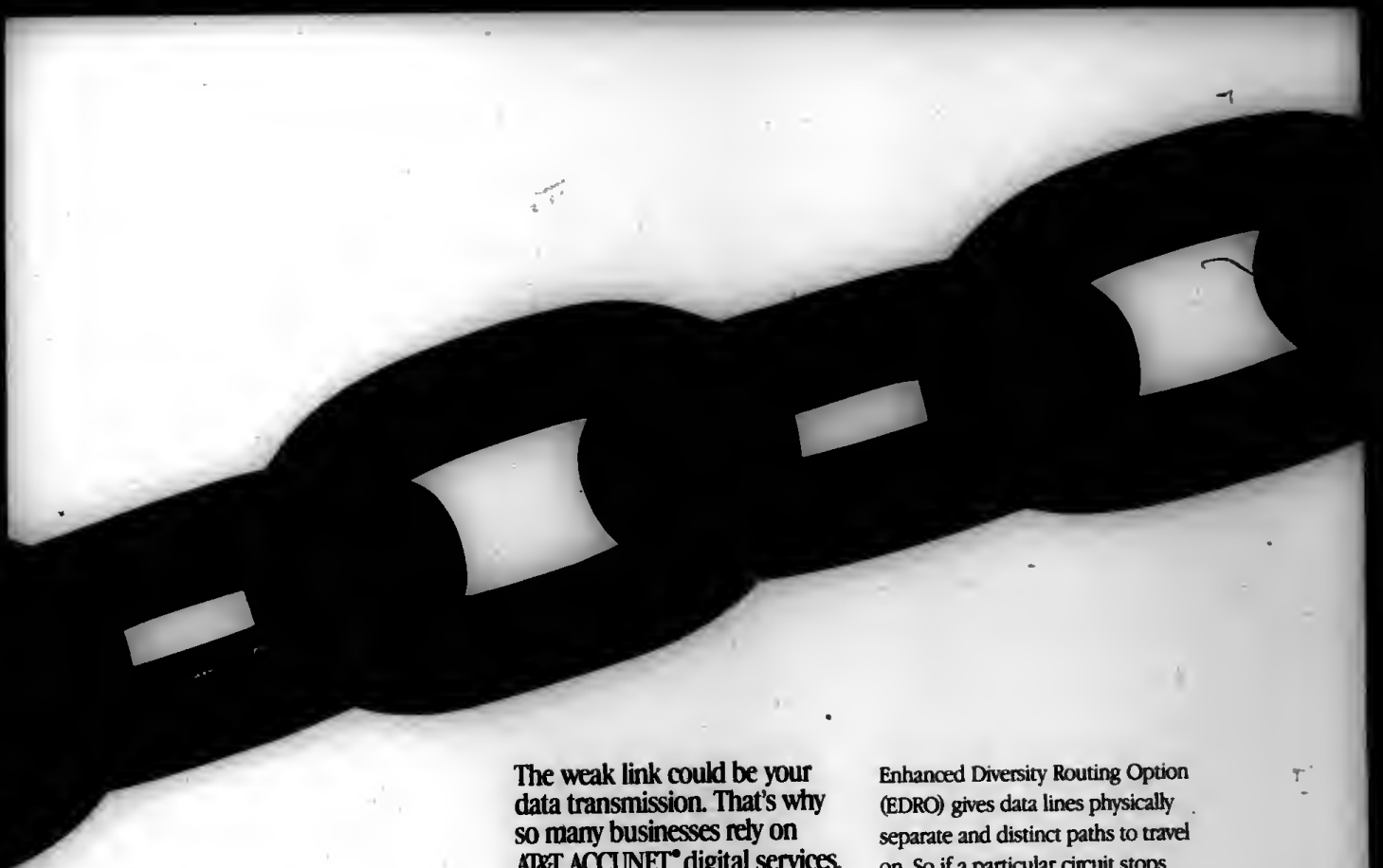

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Faster 486 could overlap Pentium

CONTINUED FROM PAGE 1

pending on Intel's announcement schedule.

Analysts said corporate users will initially shun Pentium systems in favor of DX3-based ones because of price/performance considerations and Pentium's slow production ramp.

"A chip like a DX3 would make a lot of competitive sense for Intel, and it would probably mean that there would be a new generation of machines slipped in between DX2 and Pentium," said Dean McCarron, analyst at Micro Design Resources, Inc. in Scottsdale, Ariz.

At least one user contacted said the DX3 would mean more to his company than Pentium. "We've almost ignored Pentium, but this we might be interested in, depending on its price," said William I. Lodge, a project leader at The Turner Corp., a multinational construction company in New York.

Lodge said the DX3 would be particularly interesting as an OverDrive upgrade because it would give better performance than the DX2 chips.

Sources described two versions of the DX3: One chip, targeted primarily at the portable market, is set to run at 25 MHz externally and 75 MHz internally, while the other will run at 33 MHz externally and have a 100-MHz core. The clock-tripler with the 100-MHz core would outperform anything in Intel's line except Pentium. Sources also said that by changing a single pin on the 33/100-MHz DX3, Intel can also sell it as a DX2 that runs at 50 MHz externally and 100 MHz internally. This will give vendors who have designed for the less popular 50-MHz 486DX systems a boost for their lines.

An Intel spokeswoman refused to confirm details but said, "people can expect additional members of the 486 family that will achieve higher performance — and there are lots of ways of [doing that]."

Shooting the gap

Intel needs the new part because IBM, Advanced Micro Devices, Inc. (AMD) and Cyrix Corp. are all aiming for the hole in Intel's product line that falls between the 66-MHz DX2 and the 60-MHz and 66-MHz low-end Pentiums it has announced. Sources said IBM will ship its 33/100-MHz Blue Lightning in August, and AMD and Cyrix are expected to have clock-doublers out in the fourth quarter, before Pentium can ship in volume.

Chip choices

Both the DX3 and the Blue Lightning will ship in volume before Pentium

		IBM's Blue Lightning	Pentium 66
Clock speed	50/100 MHz or 33/100 MHz	33/50 MHz	66 MHz (possibly faster 120-MHz chip)
Price	$400-$500 (expected)	N/A	$900 (in lots of 1,000)
Expected ship date	Fourth quarter	August	Shipped in March

While sources at various hardware makers said Pentium is ramping up ahead of schedule, they do not expect it will be in volume production until near the end of the first half of 1994. In the meantime, these vendors will need to counter IBM's clock-tripler, headed for the Personal System/2 line and the Ambra clone brand, expected in the U.S. in August.

Still, Intel may have to surrender a quarter to IBM and the others, as sources said it may be backing away from plans to ship the new parts in the fourth quarter.

"It's looking lately like they're going to slip into the first quarter of next year," said an executive at one hardware company who asked not to be named.

Moving to the 100-MHz-core DX2 and DX3 processors will require little redesign for system makers, sources said. The parts will fit into the same slot as a 33-MHz 486 or a 50-MHz 486DX, so vendors can simply sub these into their current system designs.

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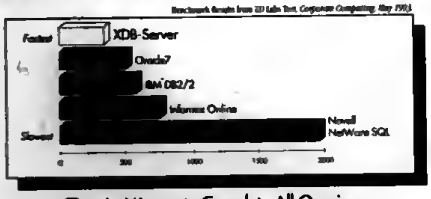

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Midrange computers

IBM to upgrade AS/400 storage

By Craig Stedman

IBM plans this fall to address the performance and upgrade issues surrounding its 9337 direct-access storage device (DASD) that have prompted some Application System/400 customers to look more closely at competing storage vendors.

IBM's Adstar storage subsidiary confirmed last week that it will add memory-based write-caching capabilities to the 9337 in an attempt to boost the DASD unit's I/O throughput, which many analysts and users view as relatively slow. Several competitors already offer such caching on their products.

Duane Dueker, Adstar's director of midrange and low-end storage subsystems, indicated that write caching will be built into new 9337 models configurable with up to 16 half-height, 3½-in. disk drives, up from seven full-height drives.

However, the new controllers needed to do write caching will also be offered as upgrades to all existing 9337 models, Dueker said. IBM also will lay out plans this fall for making future controllers and I/O processors available on an upgrade basis, he added.

Until now, IBM has generally required full box swaps to get new controllers and I/O processors, Dueker acknowledged. That is becoming less acceptable to users, especially because rival storage vendors such as EMC Corp., Memorex Telex N.V. and IPL Systems, Inc. have already introduced or promised upgradable plug-compatible products.

"We've been real reluctant to buy 9337s because of the upgrade problem," said John Waetzig, operations manager at Hills Pet Nutrition, Inc. in Topeka, Kan.

Michael Bangs, vice president of information systems at Scholastic, Inc. in Lyndhurst, N.J., added that the upgrade issue "absolutely" played a role in a recent decision to buy AS/400 DASD units from IPL rather than IBM.

Kevin Beam, director of research at Reliability Ratings, Inc., a Needham, Mass., performance rating company, said rival vendors have focused on taking away high-end upgrade business from IBM. "If you're IBM and you see AS/400 revenues flattening out, you take your upgrades much more seriously," he noted.

IBM still plans to require box swaps for changing disk drives, despite moves by IPL and Memorex Telex to support in-box drive upgrades, Dueker said. Upgrading drives "is a sell tactic, but I question how valid that is," he added.

Falling behind

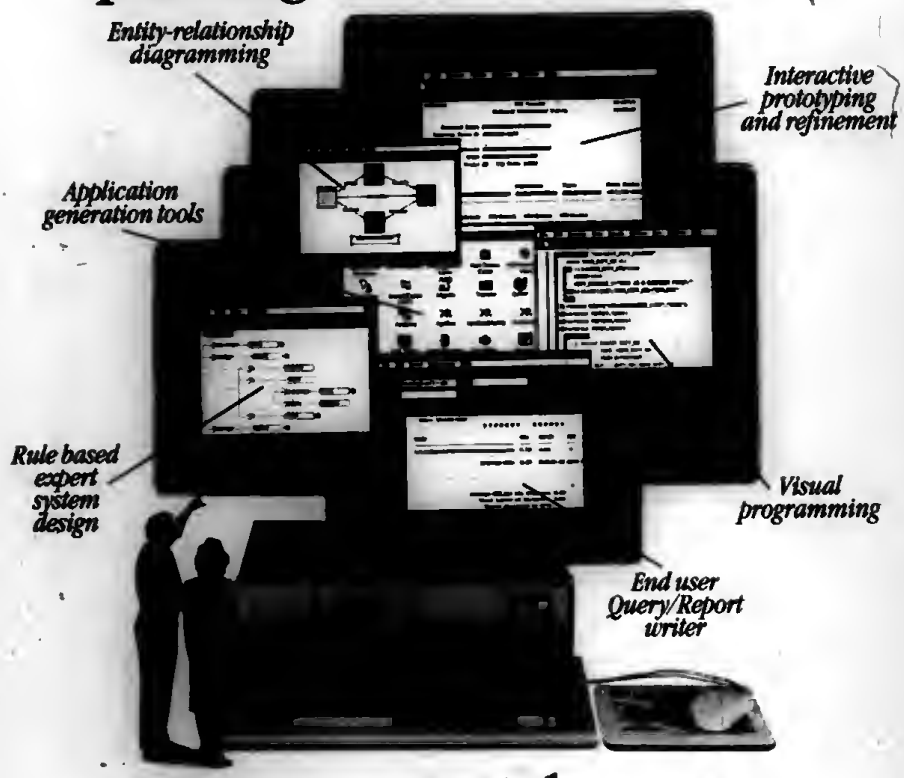
The 9337's I/O performance also has been an issue for some AS/400 accounts. Waetzig said Hills was "seeing some long access times" on its 9337s until IBM supplied an operating system fix with some caching support. A 9336-compatible Memorex Telex subsystem bought in April is still "considerably" outperforming the 9337, he added.

Marc Cohn, senior vice president of IS at Enterprise Rent A Car Co. in St. Louis, has not had problems with the more than 200G bytes worth of 9337s he currently has in place. But Cohn said he expects the 9337 to be "outstripped in terms of processor speed" now that Enterprise is upgrading from the AS/400 E95 to the newer F95.

Adding memory-based write caching to the 9337 "is one of the ways to move the performance along," Cohn said. However, he added that while he waits for IBM to make its move, he is keeping "a relatively open playing field" for his next DASD purchase, due within 90 days.

IBM offers disk-based caching for redundant arrays of inexpensive disks (RAID) versions of the 9337, but Dueker said the memory approach should provide "much better performance" and will work on both RAID and non-RAID models. The change will also open up an eighth slot for data drives, he added.

"Wow, that's what I call pushing the boundaries..."



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A labor of labs

In a post-Cold War age, national labs struggle to broaden commercial appeal

By Gary H. Anthes

If you think about high-performance computing at Los Alamos National Laboratory, you might well imagine a supercomputer modeling airflows around an atomic bomb as it sails across the New Mexico desert. But for Gillette Co., the lab is a place to model the flow of human skin under the latest experimental razor.

Gillette, which went to Los Alamos to use its high-performance computer systems and to tap into its expertise in materials, is one of a number of firms that have discovered a gold mine of hardware, software and technical smarts at the national laboratories, which spend some $600 million annually on information technology.

Support for the computer industry by the U.S. Department of Energy's (DOE) national labs is not a recent phenomenon. Los Alamos helped IBM develop the 7030 "Stretch" computer in 1956, thereby laying much of the architectural foundation for the fabulously successful 360 line of mainframes, and without patronage from the labs the U.S. supercomputer industry would scarcely exist.

Peacetime panic

But since the end of the Cold War, the labs' efforts to transfer technology to the private sector have taken on a zeal bordering on desperation. Taxpayers and congressmen are wondering what the labs are going to do with $6 billion a year now that developing H-bombs has gone out of style. And a number of parties are scrambling to redefine the labs' mission in a way that will boost U.S. technological competitiveness while creating private-sector jobs.

Some observers insist you cannot beat swords into plowshares at the national labs, saying that missions, cultures, time frames and technologies do not mesh with those in the private sector (see story at right). They argue that the labs should be allowed to atrophy gracefully in the face of shrinking budgets or should be "privatized."

Craig Fields, chairman and chief executive officer of Microelectronics and Computer Technology Corp., the Austin, Texas-based consortium for research and development in information technology, said some of the efforts to reshape the labs put the cart before the horse. "It's like saying, 'I have this 14-in., insulated Phillips screwdriver; what can I do with it?' instead of saying, 'I'm trying to build a house; what tools do I need?' "

Fields said the role of the labs should be driven by a national technology plan that uses the labs appropriately, not by a laboratory plan concocted to ensure survival of the facilities.

Fields offered two ideas for getting technology out of the labs and into the commercial world:

- The labs could spawn small, highly focused enterprises that would serve as technology suppliers to larger companies.
- The labs could also form consortia with groups of companies in which the parties would share costs but the firms would control the funds provided by the government. Such a consortium would be devoted to relatively difficult, long-term efforts such as developing technology for flat-panel displays.

While there is much commercially relevant technology at the labs, and while the labs are earnestly trying to inject it into commerce, computer firms have been inhibited from approaching the labs by contract marathons that can take longer to complete than the life cycle of products the firms are trying to develop.

"It's a god-awful process because of the incredible bureaucracy and the centralized management and micro-management by DOE," said a laboratory official who asked not to be named.

In response to that frustration, the computer industry through the Computer Systems Policy Project last year worked with the DOE to craft a model cooperative research and development agreement (CRADA) intended to grease the skids for joint deals.

The model CRADA has been a limited success so far, said John R. DeMember, manager of federal research and development at Digital Equipment Corp. He said it shortened the time it took to get the Alpha workstation farm project going from about 20 months to five months. Unfortunately, DEC had to work with the DOE for 18 months before the CRADA process even kicked in.

Fuel injection *is one technology under study at the Los Alamos lab in partnership with private-sector companies*

Local control

Now, industry and the laboratories are urging that more control over technology transfer be put directly in the hands of laboratory directors, getting Washington out of the loop. In addition, the DOE is working on a revision of CRADA that it says will further streamline contracting.

In the meantime, Los Alamos has begun a promising program called the Computational Testbed for Industry (CTI), which is locally controlled and can get laboratory/industry collaborations going in as little as a week.

Digital Equipment Corp. just signed an agreement with Los Alamos under which the two will jointly develop a "farm" of Alpha workstations to solve large, parallel computational problems.

Gillette is a CTI user, as is an oil company that came to Los Alamos to use the lab's massively parallel CM-5 supercomputer from Thinking Machines Corp. The oil company also taps into the lab's expertise in I/O management and algorithm development, said Bruce Wienke, CTI director.

David Nelson, associate director of energy research for scientific computing at DOE, said that in the past, industry benefits from joint work with the labs often fell out as an accidental by-product.

"We can't afford to do that anymore, and we don't think it's appropriate," Nelson said. "The mode now is to work with the vendor with the aim that laboratory software will go into the vendor's products."

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> *–PC Computing 6/93*

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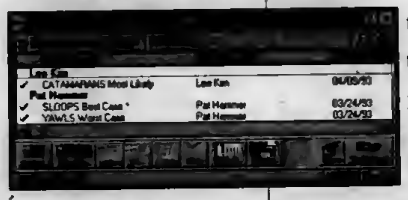

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Quick isn't dirty

There are probably some situations where structured methods are the best way to approach software development. I just haven't seen any lately.

Everywhere I go these days, development groups are churning out multiple iterations of application designs, spurning anything that smacks of a structured framework.

"I don't care whether we use pencil and paper or crayons and drawing tablets . . . whatever works," one IS exec told me recently. In fact, his developers use Visual Basic to develop multiple prototypes *and* eventually build finished applications. A lot of people think this product is nothing more than a toy, he said, but it gets the job done. And it lets the real experts (the system users) feel like experts.

Structured methods just don't work, according to this manager: "None of that bears any relation to the way things are done today."

The way things are done today is fast, cheap and with the maximum amount of reality-checking along the way.

There are a couple of nice side benefits for IS in working this way. One is that the intended recipients of the system get to see, through all the back-and-forthing, that this translation of actions into code really is a creative process. Another benefit is that you get to develop in small, manageable, budgetable pieces.

Large systems projects have always been difficult, if not downright impossible to estimate; there are just too many variables involved. Of course everyone always hears your rough estimate as a hard figure, which means you're on the hook when something happens to bump the project over budget. And something always does happen; it's some kind of law of computer science.

Of course, even with iterative prototyping you still have to sit in budget meetings and come up with estimates that may or may not be accurate to within four figures. What is different, though, is that you know you won't be spending all the budgeted money just for requirements and you know the half-year mark won't roll around with nothing concrete to show. At the very least, you'll have some very nice wall art and, more likely, you'll actually have something up and running. Best of all, you'll have your job.

In case you've dismissed the fellow above as an aberration, let me tell you about another — the IS director of a privately held Midwestern hardware retailer. This man hasn't had his job all that long, but he's already an old-timer compared with his two predecessors, both of whom lasted three to four months.

What was their problem? These men were by-the-book sorts who analyzed and calculated every move, he says. They were not the type of managers who would have felt comfortable prototyping applications on Paradox or Quattro Pro. They weren't "entrepreneurial." Nowadays, there's hardly a more damning description . . . except maybe "structured."

Joanne Kelleher

Joanne Kelleher, *Features editor*

'Lite' approach

Regarding "IS group forms to compare processes" [CW, July 5]: If the comments contained in this article are characteristic of our industry, they portray a frightening commitment to benchmarking "lite."

Of the many kinds of benchmarking, the two described in the article are among the less productive. Any firm needs to be aware of how its operations compare to others in terms of cost and revenue. And benchmarking processes among competitors are a useful way to stay on top of the state of the practice in your industry. However, benchmarking that really delivers is based on a company's realization that some particular process is crucial to its customers. From that springs the creativity it takes to go beyond "round up the usual suspects" and reach outside to find a brand new way to look at that process. That's the kind of benchmarking that pays off.

The "lite" approaches (costs and in-industry process benchmarking) are necessary but not sufficient to identify and bring about major change. And a danger is that they can easily provide excuses for delaying or for not making improvements.

Mac Patrick
Benicia, Calif.

Wanted: c/s tools

My kingdom for a good wrench!

Or a good set of client/server security administration and reporting tools. Now I may sound like one of the proverbial wolves howling into the wind on some Southwest desert basin, but I get the feeling there are going to be lots of "us wolves" out there looking for some client/server sheep to kill in the near future.

All those security issues the industry had 40 years to resolve in the mainframe world seem destined to be resolved in a fraction of that time in the client/server world. This is probably going to result in a confusing, disjointed "cluster influx."

I have taken the leap of faith and jumped into the client/server direction a firm has chosen. We are primarily a Microsoft Corp./Sybase, Inc. SQL and OS/2 shop with windows on our workstations. I administer the database access security for all our client/server applications. We use some primitive ad hoc reporting tools, and we do some C coding ourselves. However, overall we do not have any enterprisewide security administration or reporting tools.

What I need is a set of tools that will cover all the servers and all the databases on those servers. I'm not asking for much. I see all these nice-looking GUI applications with the pretty pictures for the users to select from. Why can't I have one?

Kevin P. Kenefic
Houston Lighting & Power
Houston

Accountant's view

One thing is readily understood from your article "Faster product cycles at odds with accounting rules" [CW, June 7]: You do not have a clue about accountants and what they do. This kind of article only serves to reinforce the view that those in information technology cannot see anything beyond their terminal screens.

Accountants are at the forefront when trying to attach realistic values and life spans to assets. Various methods, including some that made adjustments for inflation, have been mooted during the past 20 years, but all have flaws and no method has gained universal acceptance.

The article does have a point, however. The irony is that it is not the bean counters who are the culprits; it is company management that wishes to spread costs over lengthy periods — usually when faced with a board concerned about the effect of volatile profits on the share price. The accountant is then told to forget realistic depreciation schedules for the good of the company, the shareholders and, of course, the president and sundry vice presidents — the very same people whom you quote as complaining about accountants.

A. D. Rankin
Hong Kong

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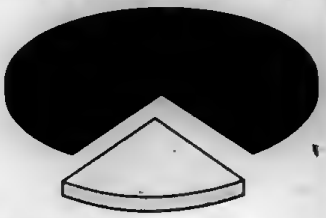

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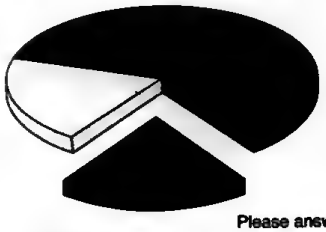

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Please don't take my keyboard away

Michael Cohn

Something very dangerous is going on here, and only a handful of us have noticed. Keyboard users are quietly becoming an endangered species.

It started innocently enough with the touch screen. But when pen-based systems showed up, I became suspicious. Now there's voice recognition, palmtops and even handhelds with no keys at all!

So let me go on record: No one's going to take my keyboard away.

Computer manufacturers are off-track. Keyboards aren't coffee filters, and no newfangled notion can replace the clicking I've known all my IS life.

People *need* keyboards. First of all, they make you *sound* busy. "I'll have to call you back, Boss, [click click click] I've got my nose pressed firmly to the grindstone." Over the phone, no one can tell if you're typing an eight-page memo or just resting your elbow on the backspace key.

Keyboards are also the perfect place to put things. They're a great spot to leave an envelope and even better for little yellow stickers that say "Harry, meet me for lunch at Big Ed's."

Think of the confusion if we didn't have keyboards. You're buying a plane ticket. Or you're renting a car. What if the lady behind the counter used voice recognition? You'd never know when she was talking to you:

"Return!"

"Saturday, June 19."

"No, sir. I was talking to the computer. Home!"

It could be a nightmare. Everyone would get frustrated, and you'd probably wind up getting the Taurus with the broken radio.

I've got nothing against efficiency. If there's a better way, I say use it. The mouse caught on OK, right? People point and click like the dickens. But I'm really not much for pointing and clicking. I can't even point and click with a camera and have several shots of people's feet to prove it.

I admit, some folks hate to type. The hunt-and-peckers gleefully await the keyboard's demise. But if we give up our keyboards, we give up our souls.

The keyboard is the final frontier, our last chance to touch and feel technology. The keyboard is warm and friendly. It moves and responds to our gentle touch. Who wants to touch the screen with a boring stylus? Or with your little finger? Pinky technology? It's embarrassing.

Don't tell me a computer can recognize my writing. Don't ask me to communicate with a computer the size of a TV remote. You'll feel the same way, especially when you lose thousands of dollars in computer equipment between the cushions of your family room couch.

Some day there will be better, faster and easier ways to get into your computer. But not for me. If it ain't broke, don't fix it. Shoot your mouse. Pass on palmtops. The keyboard has always been a foolproof way to use a computer. Let's keep it that way.

Cohn and his keyboard share an office in Atlanta.

Just-in-time training

OPEN MIND *by* Esther Dyson

In the world at large, conventional wisdom is switching from the capital-equipment model of investing to the continuous improvement model. Instead of doing a needs analysis, buying some equipment, using it until it's worn out and starting over again, you are continually assessing your needs, buying stuff, improving it and changing as you go. In the systems world, the equivalent notion is that re-engineering never stops. It's not something you go through once every five years but something you do continually.

Yet with people, we're still in the capital-equipment mode. Draw up a job requisition, hire someone, train him and let him grow on the job. Then start over with more requisitions.

This picture is a little exaggerated, but generally training is considered an event rather than a continuous process.

With this as background, let's take a look at the notion of performance support — sometimes known as just-in-time training.

Technically, performance support looks like easy database and context-sensitive on-line documentation. The tools to build this system are the same ones used for on-line support, data access, content-based retrieval, multimedia displays and friendly user interfaces. What's different is the content and the approach.

The distinction is subtle, but the impact can be huge. On-line performance support encourages people to think about their jobs as they work rather than simply assisting them with computer tasks. Moreover, they keep learning as they perform their jobs, rather than in discrete classes.

Performance support allows new procedures, insights and knowledge to be shared throughout the company, rather than kept by a few. In fact, it can be a groupware application: Performance support content can come from other workers as well as from management. It need not — should not — be rigid and fixed (although there should be someone to vet it so that misinformation is not spread).

Here's a scenario, courtesy of performance-support wizard Gloria Gery:

Juan calls the Add-a-Card hot line in a huff. He has just been told that his payment is overdue and he's annoyed. He wants to cancel the card. Alice, a new Add-a-Card operator, takes the call. She doesn't know Juan, of course, but he's already screaming at her. "I charge $12,000 a month, and you lousy people . . ."

Does he really charge $12,000 a month? (Alice herself earns $12,000 a year.) Does he normally pay promptly, as he claims? Good data capture and display could quickly show Alice the answers. Better yet, an expert system could answer the questions: is this customer profitable to us? Should we try to keep him or get him to pay up and then . . . good riddance?

But what Alice needs is not so much an answer, but a *strategy*. It's up to her to handle Juan, but the system — performance support — can give her guidance on her goal.

This system doesn't insult her intelligence by giving her a script to read, but it lets her feel in control by knowing what her company is trying to accomplish: Keep Juan or lose him.

Like Alice's job, many jobs are changing, or have heavy turnover, and encompass a wide range of tasks and information that no single person can learn in full. It's not worthwhile to train people completely; rather, performance support equips them to learn as needed. Some tasks occur so rarely that they're not worth learning, but it's handy to have the requisite support available.

Dyson is editor of "Release 1.0" and "Rel-EAST," newsletters on new technology and new computer markets in Eastern Europe

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Charles Babcock

The next PC wave

If you are waiting for the influx of PCs into your shop to abate so you can catch up on your LAN and database server work, forget it. Not only is last year's explosion of PC sales continuing, but the PCs being installed are also adding huge capabilities to the desktop.

As more and more 386, 486 and Pentium systems appear on desktops, they lay the groundwork for linking distant elements of the organization as surely as ties added to the transcontinental railroad. An irresistible framework is being put in place for client/server computing.

Egil Juliussen, who publishes the *Computer Industry Almanac*, has been tracking PC sales. He projects that 33 million Intel-based 80386, 1486 and Pentium units will ship worldwide this year, one-third of them in the U.S.

Nine years ago, 33 million units represented the entire installed base of PCs.

Some observers think 33 million is too low. That figure is based on end-user purchases as tracked by Storeboard and Computer Intelligence, which watch key retailers.

Daniel Klesken, an analyst at Robertson Stephens & Co. in San Francisco, uses a supply-side model that tracks shipments of Intel-family microprocessors produced by Intel, Advanced Micro Devices, Cyrix, IBM and Texas Instruments. He said he believes 46 million PCs will ship in 1993 based on the CPU numbers. If you add in Macintoshes, the figure goes to 50 million, which puts the rate of PC purchasing two years ahead of most market researchers' projections, Klesken notes.

Escalating demands

Not only are PCs rapidly spreading throughout the business world and home offices, but their networking and client/server capabilities also far surpass those of their stand-alone forebears. "The installed base is shifting rapidly," with 8088s, 8086s and 80286s being replaced by 1486 machines, Juliussen says.

Five years ago, 8088s, 8086s and 80286s represented 84% of all MS-DOS PCs. By the end of 1993, most of these PCs will have been replaced in commercial environments, with 91% of the installed base made up of 386, 486 and Pentium computers. Juliussen predicts that 60% will be 486-level machines (1% will be Pentiums).

Nearly everyone will have a computer capable of mounting a GUI, a 32-bit operating system and powerful applications. This lowers the threshold at which newcomers learn to run a computer. It increases the number of applications they use, building traffic on the network.

It is no longer an accomplishment to get a workgroup hooked together on a LAN. The current demand is for the interconnection of LANs, frequently of dissimilar design, and gaining access to the WAN. At the same time, demand builds for the distribution of data over the interconnected LANs; and data administrators must implement server database systems, plotting their control points, user privileges and security measures in the process.

In effect, client/server systems are being implemented at an accelerated pace, whether or not IS is ready.

To do it right, a contingent of IS personnel must be committed to work with these PC technologies and build an infrastructure that enables them to work with corporate systems, navigating many treacherous reefs in the process.

• • • • • •

A second opinion: Microsoft Chairman Bill Gates has been quoted as saying Windows NT is a form of Unix. Tony Parkhill, marketing vice president of Silicon Valley Software in San Mateo, Calif., a maker of tools and compilers for both Unix and NT, says, "We know it not to be."

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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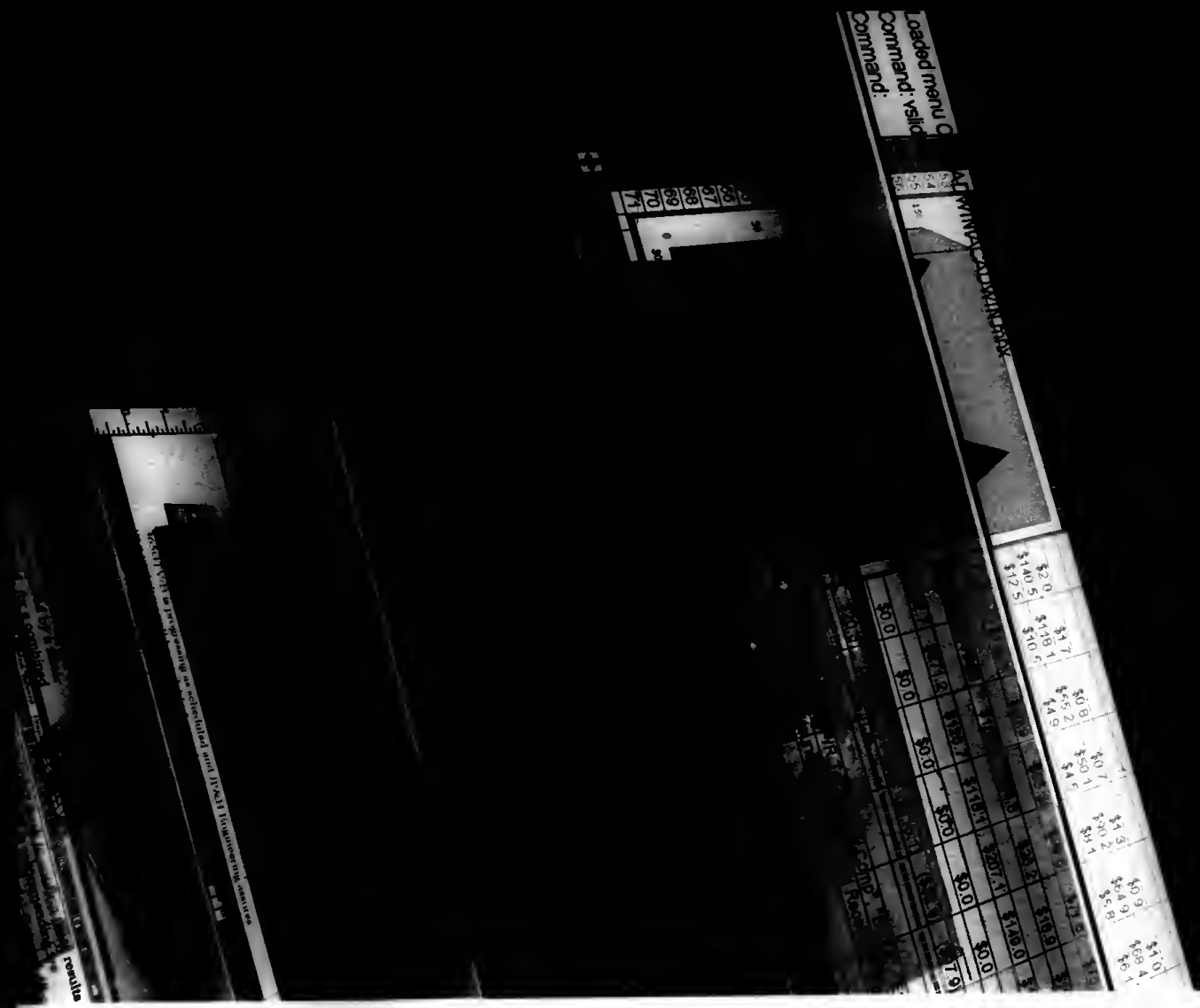

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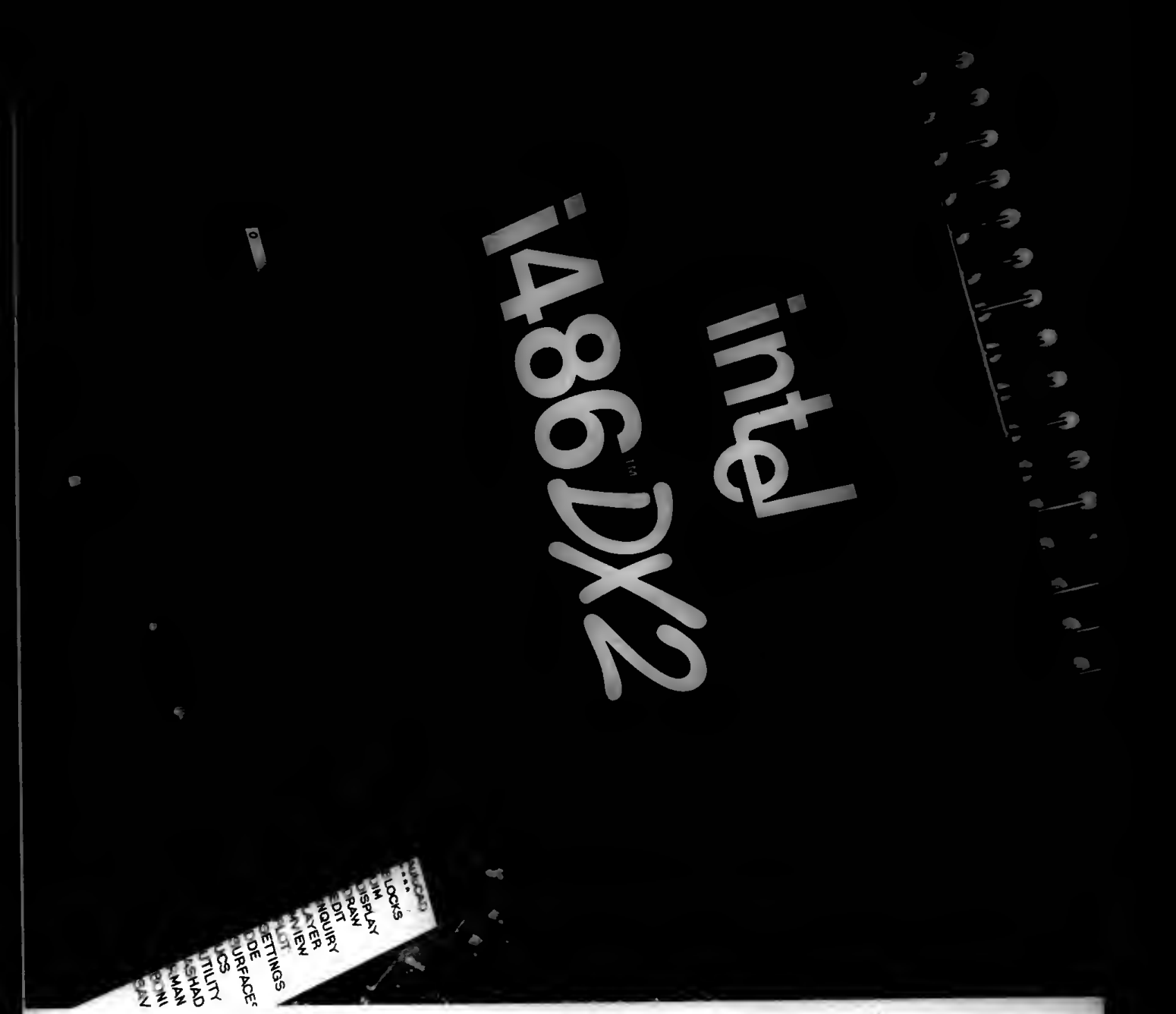

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Portable computing

Macintosh Duo draws kudos, caution

By James Daly
CUPERTINO, CALIF

Where's the most valuable chunk of real estate around? Midtown Manhattan? The French Riviera? The folks at Apple Computer, Inc. think it might be a lot closer to home. They think it could be your desktop.

Last October, Apple introduced the Macintosh Duo system, a convertible model that offers both the power of a desktop PC and the flexibility of a notebook system. After nine months of using both the Model 210 and 230, Duo system users give both machines generally high marks, with some caveats.

"It's basically a very fine machine, but [there are] a few rough spots," said Mike Veaudry, partner and national director of systems at Ernst & Young in Toronto.

The $1,839 Model 210 and the $2,299 Model 230 let users insert — or dock — a PowerBook Duo portable into a desktop station that is connected to a full-size monitor as well as a variety of peripherals and network resources.

The idea is not new: NEC Corp. created the idea several years back and companies such as Compaq Computer Corp., IBM, Toshiba America Information Systems, Inc. and Zenith Data Systems have checked in with similar dockable systems.

It is a trend that is likely to continue. The Business Research Group reported that it expects the portable's use to grow dramatically during the next five years.

Apple's Duo strategy *was designed to appeal to price-conscious businesses such as real estate*

Despite those forecasts, Apple officials acknowledged that sales of the convertible Duo systems have not taken off as they first envisioned. "It was a bit of a slow start," said Peter Fletcher, worldwide product manager for Apple's portables division.

Like many Apple models, the Duo was bedeviled by an initial scarcity of product. Both models were hard to come by at first, and the Duo's docking mechanism was not available in quantity for up to two months after the

Duo, *page 44*

Memory management? Depends on your needs

By Christopher Lindquist

It seems everyone is helping you lose your memory these days. Just when you thought your PC was safe, someone comes along (can you say Microsoft Corp.?) and starts suggesting that you add virus protection, data compression and even delete protection to the already cramped conventional memory on your system. What to do?

PRODUCT test DRIVE

MS-DOS 6.0 does include MemMaker, its own memory management utility, but it only works with MS-DOS 6.0. And some reports could lead you to believe that the Microsoft product is not exactly the epitome of memory management art. It will do the job, but could it be done better?

The answer is yes.

Both Quarterdeck Office Systems, Inc. and Qualitas, Inc. have released Version 7.0 of their respective memory managers. (In truth, Quarterdeck is on Version 7.01, which fixes several minor bugs in the original release.) And besides freeing up more memory, the Quarterdeck Expanded Memory Manager (QEMM) and Qualitas' 386/MAX offer several features that should appeal to power users.

Testing the products consisted of starting with "unmanaged" MS-DOS 6.0 configurations on a pair of 80386-based PCs: one with DoubleSpace data compression and the other without. Each system had a variety of resident programs and drivers — mouse, network, virus filter — in addition to the normal system files such as COMMAND.COM.

Each memory management product comes with the facility to do a relatively unattended installation that requires little more than hitting the Enter key a few times. All the products also claim to be easy to use, so the default installation and management procedure was selected for each. All three installed and optimized flawlessly, with no need to "hand tune" any operation.

After installing and optimizing each product, we compared the results.

Up to 632K bytes

Is MemMaker as poor at retrieving memory as its detractors say? No, at least not for the average user who does not want to play with memory addresses. On the machine without data compression, my basic configuration left me with a 596K-byte "largest executable program size," a figure small enough to possibly cause problems with some applications. Running MemMaker brought the total up to 613K bytes, as it loaded some device drivers high. 386/MAX performed even better, using its ExtraDOS technology to move more of DOS high and recover 625K bytes. However, QEMM outdid them both, bringing the system 632K bytes of free conventional memory.

QEMM shone even brighter on the system with data compression. The DoubleSpace device drivers chew up some 43K bytes of conventional memory, which neither MemMaker nor 386/MAX was able to recover. QEMM's Stealth Double Space feature was able to recover most of this, leaving the system with 624K bytes of free conventional memory compared with 558K bytes with MemMaker and 575K bytes with 386/MAX.

QEMM's Manifest feature *is a memory-diagnosis utility that Quarterdeck Office Systems hopes appeals to power users*

This does not mean you should immediately purchase QEMM 7.0 for all your systems, of course. For many users, MemMaker will suffice — and it comes free with MS-DOS 6.0. Secondly, memory management is something of a black art: What works on one machine may not work on another, depending on your hardware and software configuration. The only way to really know how much memory each of these products will recover for you is to try them.

Finally, QEMM and 386/MAX come with other utilities and features that may be compelling, particularly to more advanced users. Both can use video random-access memory to increase the size of DOS sessions under Windows. Each also includes extensive Help files, memory management tips and configuration editors to help the more experienced user tweak the last bit of free memory out of a system or work around conflicts. QEMM comes with Manifest, a full-featured memory diagnosis utility. 386/MAX also includes a memory utility, ASQ, as well as a memory tester and a .PIF editor for maximizing DOS sessions under Windows.

For average users without serious memory-shortage problems, MemMaker is certainly the most cost-effective technique if you own MS-DOS 6.0. But for other DOS versions or systems where memory is crucial and at a premium, QEMM 7.0 and 386/MAX are worth the price.

QEMM 7.0 and 386/MAX are available now for a retail price of $99.95 each. BlueMAX, the IBM Personal System/2 version of the product, lists for $125.

Christopher Lindquist

Sharing litigious chatter

Is it libel or slander if you say it on a bulletin board system? I've seen several comments on the boards recently that a civil lawyer would have to love. These are the types of things that if you said them on TV you'd be spending some time in court defending yourself. It's different on a BBS, isn't it? We just say these things as if we were involved in a face-to-face argument — but we aren't.

A CompuServe user spouting about the moral deficiencies of some technical support representative isn't just talking to the rep, he's talking to anyone who happens to "turn on" the forum. And some of these forums may be more popular than your nightly news.

Think I'm kidding? Go to the Polaris forum on CompuServe. You'll see message subjects the likes of "Fraud" and "Class action lawsuit now" along with messages from users requesting their money back, complaining about more than a few bugs and looking for reviews of personal information managers other than Packrat 5.0, Polaris' product.

Oh, and one user noted that Polaris has a contract that will put some 30,000 copies of Packrat into the hands of a government agency. As the user said, "Heavens, what will they do about servicing those folks if [Packrat 5.0] is a stinker?" The vast majority of reports indicate that it is, so I wish the Polaris people luck.

Things have been a lot quieter in the big iron forums. The "Mainframe" BBS conferences still aren't seeing a lot of traffic. One "VMer" even responded that he was spending most of his time using AIX these days, "but at least it's got an IBM logo on it," he said.

Some Internet users are beginning to post various benchmarks for the new hardware out there, including the Alpha-based DEC 3000 line and the Hewlett-Packard HP 9000/735. There's nothing conclusive yet (as if benchmarks can ever be conclusive), but users generally agree they outperform most of the hardware on the market, with a slight edge for the HP boxes.

Several users noted that their Silicon Graphics R4000-based machines equaled or outperformed both the HP and DEC lines in real-world testing. But I'll leave that sort of thing to the experts.

The "experts" on the boards are beginning to come up with a consensus on MS-DOS 6.0's DoubleSpace data compression: It can cause problems. That sure isn't big news, but now that it seems to be settling into the buyers' psyches, we'll see if Microsoft can maintain those startling upgrade version sales figures. Stac Electronics and other vendors seem more than happy to kick Microsoft where it hurts these days, too (you may have seen the "Open letter to Microsoft" ads). But one user summed up the situation as such: "BlunderDome: Two vendors enter, one vendor leaves, dirty tricks encouraged. Bleh. Buy a bigger disk."

If you must use compression, maybe you should take a look at DOSPR6.ZIP on the IBMSYS forum of CompuServe. Touchstone Software has an interesting story to tell about how MS-DOS 6.0's Format command resets disk sectors marked as "bad" by other packages to "good" again (even if they are not), which can lead to corrupted compressed disks. And they're supplying (for free) an interesting hard disk diagnosis utility to help make sure your system can take DoubleSpace's pressure. (Whoops, bad pun. Sorry. Won't happen again.)

Improper use of disk caching was supposed to be one of the more common problem sources with the new MS-DOS, so Microsoft is now offering SmartDrive 4.2, a more "conservative" — and lower performance — version of the disk cache utility. Those of us who would rather be conservative can pick up the new version on CompuServe by downloading the conveniently named (and easy to remember) file S14191.ZIP in the Microsoft Software Library (GO MSL).

Some OS/2 2.0 users on CompuServe have been complaining about the cost of the upgrade to OS/2 2.1 (the lowest price seems to be $79 minus a $30 rebate for registered Version 2.0 owners). One customer said he'd continue working with Windows NT because IBM hadn't seemed to "learn its lesson" about pricing. A happy OS/2 2.1 upgrader responded by quoting a "probable" $275 street price for Windows NT — and $150 per call to the Microsoft 900 number for support. As he said, "if you think NT is a better deal than a $55 OS/2 2.1 upgrade, go for it." We'll just have to see how many actually do.

Tagline: "Every normal man must be tempted at times to spit on his hands, hoist the black flag and begin slitting throats." — *H. L. Mencken*

Have a favorite forum, BBS or service that you think others might find useful? Send it via the Internet to christl@netcom.com; CompuServe with 72360,2005; or MCI through 549-8464. I'll try to list some of the more interesting ones in future columns.

Lindquist is a *Computerworld* West Coast correspondent.

Corporate Software swaps its help desk software

By Michael Vizard
CANTON, MASS

Corporate Software, Inc. has switched its allegiance from a DOS-based help desk package developed in the UK to a Windows-based package developed by Hammersly Technology Partners, Inc. in San Francisco.

Uoder terms of the deal, Corporate Software has assumed exclusive marketing rights for the Utopia PC help desk, which was designed to help information systems shops set up their own help desks for Windows applications.

According to Carter J. Lusher, project director for PC research at Gartner Group, Inc. in Stamford, Conn., the increasing oumber of applications that users are adopting under Windows, combined with the drive to keep the oumber of IS people on staff to a minimum, is pushing companies to adopt help desk software that maintains a record of specific problems.

"Under DOS, people were using 3½ applications on average. Under Windows that oumber is up to 7.9. And IS can't throw bodies at supporting these applications anymore," Lusher said.

The help desk market is currently valued at about $60 million by Gartner Group, with annual growth expected to be more than 100% through the 1997-98 time frame.

By being able to access historical records and related technical mannals, IS shops can deploy front-line support staff who draw on this data to resolve problems, while other IS personnel focus on developing applications and other traditional IS services.

Error-tracking

For example, Medtronic, Inc., a manufacturer of medical devices in Minneapolis, has deployed the Utopia help desk in addition to four people who track and resolve problems across 2,000 PCs.

"Before Utopia, our support was based on paper memos and pagers," said Kathy Miller, Medtronic information ceoter supervisor.

Currently, Utopia consists of three modules that log and track problems, keep an inventory of hardware and software and keep track of training classes.

Prior to signing the pact with Hammersly, Corporate Software had sold about 100 licenses of Quetzal, a DOS-based help desk developed by WorkGroup Systems Ltd. in the UK.

Unlimited-use server pricing for Utopia starts at $7,900. Coocurrent user pricing ranges from $395 to $995.

[redacted]

Peripherals

QMS, Inc. has introduced the QMS ColorScript Laser 1000, a desktop color laser printer.

The QMS ColorScript Laser 1000 is based oo QMS' Crown techoology and delivers accurate renditions of color and mooochrome images and text, either separately or oo the same page. It uses a tooer-based laser technology to geoerate output that does not fade or flake. The printer is said to provide language compatibility, fast throughput, ease of use and extensive connectivity.

The QMS ColorScript Laser 1000 costs $12,499.

▶ *QMS*
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New Media Corp. has introduced its mid-range performance Personal Computer Memory Card International Associatioo (PCMCIA) Small Computer Systems Interface (SCSI) card for multimedia applications on laptop and subnotebook computers. The product fits into an industry-standard PCMCIA card slot that is incloded in most laptops.

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The product costs $199.

▶ *New Media*
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Application packages

RSA Data Security, Inc. and Datamedia Corp. have introduced SECURExchange, a Windows-based encryption product that uses the patented RSA Public Key Cryptosystem.

According to the firm, the product provides DOS or Windows electronic-mail users with the benefits of the RSA algorithm for protectioo of sensitive files.

Based on RSA's TIPEM and BSAFE 2.0 tool kits, SECURExchange was designed specifically to secure existing E-mail installations, giving users both advanced encryption and authentication features.

Prices range from $995 for a 25-user license to $19,995 for a 1,000-user license.

▶ *RSA Data Security*
100 Marine Pkwy.
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(415) 595-8782

[redacted]

Tandy superstores turn to wireless

Retailer experiments with pen-based system to eliminate long check-out lines, use of shopping carts

By Michael Fitzgerald
FORT WORTH, TEXAS

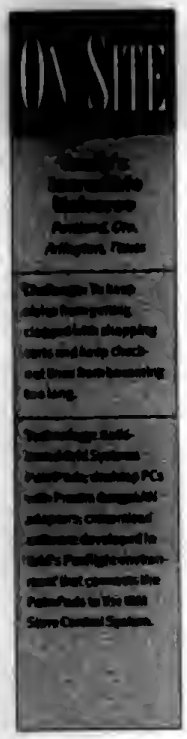
Tandy Corp.'s massive new electronics concept store, Incredible Universe, presented a big problem to the company: how to handle the hordes it anticipated would flock to a 200,000 sq ft retail outlet.

Tandy officials decided to conduct a little experiment for their big new store: install wireless, pen-based, portable point-of-sale (POS) systems. The system may yield a new trend in retailing — the end of the check-out line.

The two Incredible Universe stores, in Arlington, Texas, and Portland, Ore. — others are under construction in Dallas and Miami — equal a small shopping mall in size and sell everything from radios to refrigerators.

Because Tandy expects the stores to draw large numbers of shoppers, it wanted to find a way to both remove shopping carts from store aisles and reduce lines at check-out counters.

The portable system "allows us to have all the different [products] we have — 15,000, not including movies and music," said Rich Hollander, vice president of Incredible Universe. "We couldn't manage that inventory without our system. It also gives us a lower cost of running the store."



Hollander declined to say how much Tandy spent to build its system, other than to say the total was "substantial."

A team of engineers from Tandy, Grid Systems Corp. and IBM developed an automated order and delivery system using Grid's PenRight software environment and PalmPad pen computers using radio frequency communications. The system had to serve as both a portable POS system and a way to update inventory. The system also contains product warranty information, options such as how the product could be delivered and up-to-the-minute access to the customer's purchases.

Portable purchase

The PalmPads — 80 per store — connect to three Intel Corp.-based PCs equipped with a Proxim, Inc. RangeLAN receiver. The PCs in turn connect to the store's IBM Store Control System, which runs on an Application System/400. To record a sale, a sales representative will use a "membership" card that all shoppers receive when they walk in the door.

To make a purchase, a shopper presents the card to a sales rep, who runs a bar-code reader attached to the PalmPad over the card and then scans the bar code reader over the UPC on the desired item. Pricing, inventory status, options and service options, as well as delivery schedules, then appear on the PalmPad screen.

Sales reps will use *pen-based systems that can scan bar codes and supply customers with up-to-date information on purchasing options*

When customers finish shopping, they take their cards to the cash registers in the front of the store and pay for their goods. Hollander said that despite drawing 1 million customers to its two stores in less than 10 months, "there really aren't any lines at the register." He said the wireless system has reduced the payment process to less than a minute, compared with four to six minutes at other stores.

Shoppers either pick up their goods at the store or have them delivered to their homes, depending on what option they selected when they purchased the items.

Macintosh Duo

CONTINUED FROM PAGE 41

machines were announced.

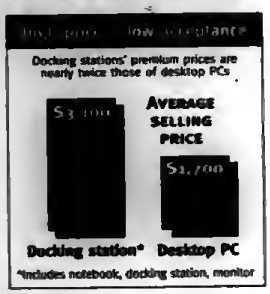
At the heart of the Duo system is the PowerBook Duo notebook computer, a modified version of the popular PowerBook portable. Users said the stripped-down Duo version has both advantages (weighs slightly more than 4 pounds, as opposed to almost 7 pounds for the full PowerBook) and disadvantages (does not have a floppy disk drive).

Docking up

After mobile users return to their desks, they insert the PowerBook Duo into the Duo Dock, which can be connected to a large color display, full-size keyboard, mouse and available printers. But here is the rub. Users need to haul around the 1-pound portable MiniDock if they want to connect their PowerBook Duo to a printer or floppy drive while on the road. "It's a bit of a pain," Veaudry said.

Veaudry has been using the Duo system with his 15-member programming and development staff, which is currently working on both IBM and Apple development. "Rather than a multiplicity of machines, we wanted them to use one," he said.

Fletcher said Apple hopes to target the Duos at price-conscious businesses such as real estate offices. "One office could buy 10 docking stations and 30 notebooks as a way of spreading around the cost of the system," he explained.



Source: BIS Strategic Decisions, Norwell, Mass.

Managers who are supervising newly Duo-equipped employees have discovered that they had to give normally desk-bound users lessons in the security of portables. Laptop computers are on the move in a lot of places these days, but not always in the hands of their owners.

Early Duo adopters have complained that the PowerBook Duo's keyboard is slightly different from the keyboard of the desktop machine, forcing users to make mental adjustments.

Another concern: The passive-matrix quality of the screen on the PowerBook Duo is also not as good as the regular Duo. A new Duo model featuring an active-matrix color display is planned for the fall, Apple analysts said.

Buy now

In a move perhaps designed to ensure that large corporate sites do not postpone their purchases of existing Duo systems, Apple will also provide an upgrade path to the color model, Fletcher said. There will also be an upgrade to current Duo Docks to accommodate the slightly thicker color Duo.

On the plus side, the Duo System gets high marks for the PowerLatch docking technology, so users do not need to connect any cables when switching from desktop computing to notebook computing.

Other docking systems require users to reconnect cumbersome cables and reconfigure start-up files every time they want to use their notebook in the docking station.

PC price wars spur more Macintosh cuts

Apple began another round of Macintosh price slashing last week with reductions of up to 31% on the sticker prices of many desktop, portable and server computers.

The moves come as Apple struggles to get the price of its Macintosh PC in line with the fiercely competitive market for IBM PC clones.

On the high end, the entry-level version of the Macintosh Workgroup Server 95 system was cut 20% to $6,089. The starting price for the Quadra 950 was likewise reduced 29% to $3,999. The portable PowerBook 165C was the biggest beneficiary of the price cuts: One model was slashed 31% to $2,339. Prices are effective through Sept. 20.

In addition, Apple kicked off a "Performa payback" rebate promotion, offering rebates of $100 to $200 to customers who purchase one of the five Performa models.

Analysts, however, said they expect Apple to cut prices even further. Despite the new round of reductions, Apple's Quadra machines still cost $200 to $600 more than competing IBM-compatible models, according to Computer Intelligence (CI) in La Jolla, Calif. Some of the PowerBooks still cost as much as $300 more than similarly equipped portables, CI said.

— *James Daly*

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Multiprocessing systems

IBM server to compete against AS/400

By Michael Fitzgerald
SOMERS, N.Y.

IBM PC Co. officials have promised to address some shortfalls in the company's server strategy by the end of this year. It will do so by offering multiprocessing PC servers it claims will compete no-holds-barred against the Application System/400 and other large system stalwarts for IBM.

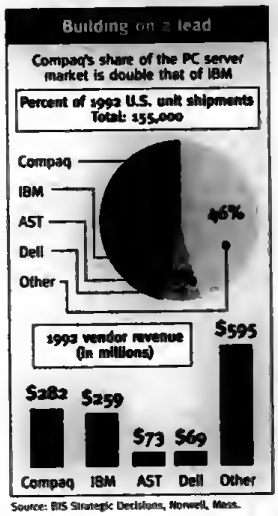
IBM, which looked well-positioned to attack such a market after its alliance with Parallan Computer, Inc. last year, has largely stood by and watched as other vendors, notably Compaq Computer Corp., have taken the lead there.

IBM's sluggish approach to the market means it faces a challenge of winning back customers who think of other PC vendors when it comes to client/server or have been lured to Unix.

The PC Co.'s strategy has been to position its high-end Server 195 and 295 boxes — the single and dual-processor systems it gained in its deal with Parallan — as boxes that have server management capabilities and built-in resilience to handle client/server projects.

However, at least one user questioned whether Parallan can help IBM, or vice versa. "Inasmuch as the Parallan is the most problematic box we've ever had, I'm not optimistic that IBM can make it a mission-critical server," said George Roukas, director of computer services at a Fortune 50 financial services company.

Roukas said he was looking seriously at Unix-based servers.



Source: BIS Strategic Decisions, Norwell, Mass.

Golden goose

"We recognize we have a problem with visibility in the client/server market," said David B. Saxby, general manager of server systems at the PC Co.

"If you look at our technology and our heritage, there's a golden egg sitting on the ground waiting for us to pick it up, but if you look at reality, it seems like that golden egg is way up on the beanstalk," he said.

In order to reverse that situation, Saxby said the PC Co. needs to improve its relationships with value-added resellers, integrators and software makers, as well as push its technology forward to gain some visibility.

In addition, Saxby said, the PC Co. in the second half of the year will push vigorously into this market, building "high-capacity, scalable, fault-resilient servers that will replace the AS/400 or mainframes."

Signs of the PC Co.'s server future came at PC Expo in New York, where it demonstrated a Model 95 with built-in redundant arrays of inexpensive disks, the first "tower"-type of PC server with such capabilities. It also demonstrated a print-server attachment that sent data at a blazing 2M byte/sec. through the parallel port.

Model year

IBM's four server lines — the Model 35, Model 95, Model 195 and Model 295 — will probably make up a separate brand by year's end.

And among some of IBM's expected moves will be faster processors, such as 60- and 66-MHz Intel Corp. Pentiums in the Model 95, 195 and 295, as well as clock-tripling chips from IBM, sources said.

The high-end line now supports only two processors, and support for additional processors is also expected.

Taking on Compaq

These changes will represent the PC Co.'s first concerted efforts to articulate how it will compete with market leader Compaq in the PC server market. The PC Co. should deliver its new products around the time of Compaq's fall announcements [CW, June 14].

Analysts said the PC Co.'s move comes as the market is still developing, meaning it should be able to make itself into a serious competitor.

"There's room in the market for both companies and probably others as well," said John O. Dunkle, president of Work-Group Technologies, Inc., a market researcher in Hampton, N.H.

Saxby also said the PC Co. is working on strategic relationships with vendors such as Novell, Inc. and developing better system management software and other performance features.

Positive feedback

Saxby's statements pleased some users.

"We're really happy to see IBM getting involved with this, and I hope it means a commitment to the high end of the server market," said W. B. Soper, manager of information services at Chevron Canada Ltd. Chevron uses two Parallan boxes, and Soper said the PC Co.'s plan to enhance the Server 295 was "great news."

In addition to working on strategic alliances, shoring up its service and bolstering its technology, the PC Co. will likely make some marketing moves, such as splitting the Personal System/2 line into separate brands for desktops and servers.

"We already have begun to think of the server line as different than the desktop, so it's on its way to becoming another brand," said Michael Coleman, the PC Co.'s vice president of marketing and brand management.

Software boosts data access

PC applications gain link to mainframe data

By Michael Vizard
SANTA CLARA, CALIF.

■ Edify Corp. has extended its automatic information-retrieval software to PC applications as part of an effort to allow PC applications to access data stored on mainframe and midrange systems.

The Electronic Workforce software comprises a series of agents written in C++ language. The agents allow users to automate structured work-flow processes by clicking on certain icons that represent specific functions encapsulated as an object.

As a result, users can click on an icon that represents the answer function and then link that icon to either a phone or fax. From that point, users can link those functions to a series of other icons to create a work-flow process that will follow a predefined decision tree.

With Release 2.2 of Electronic Workforce, Edify has incorporated support for PC applications by adding Dynamic Link Libraries that can be used to call a variety of application programming interfaces as part of a specific work-flow process. As a result, users will, for example, be able to query a specific database and have those reports automatically put into a specific spreadsheet format using either electronic mail, fax transmissions, SQL or remote procedure calls.

"Corporations have lots of people whose sole job is to cut and paste reports from databases into spreadsheets. Those people are in trouble," said John Faig, an industry analyst at Meta Group, Inc. in Westport, Conn.

For example, Applied Materials, Inc., a Santa Clara, Calif.-based manufacturer of large equipment used to make microprocessors, has adopted Electronic Workforce to automate many of the routine processes in its human resources department. These include providing information on insurance and 401K programs.

Dial-in service

To accomplish this, Applied Materials has deployed an Intel Corp. 1486-based PC running OS/2 with 32M bytes of memory and a 1G-byte disk. Employees dial into this server and initiate an action using a Touch-Tone phone. The Edify software then polls a human resources application by Collier-Jackson, Inc. that runs on a server from Hewlett-Packard Co.

Previously, Applied Materials had to support these requests by processing paper forms. "We figure it saves us having two people spend two weeks processing this data every quarter," said Ray Moore, manager of domestic compensation.

"We figure that most people are spending anywhere from 10% to 50% of their time finding data, packaging it up and sending it out to somebody. We think we can automate that entire process," Edify President Jeffrey Crowe added.

In general, Faig said automating work-flow processes is an emerging field, but he said Meta Group expects the technology to be used more extensively as it matures.

"There's not a lot being done in terms of work-flow automation, but people are going to get tired of running the same standard reports every day," Faig said.

Pricing for Electronic Workforce 2.2, which is currently available, starts at $10,000.

Client management

Microcom adds support to LANlord

By Michele Dostert

Microcom, Inc., a Norwood, Mass.-based vendor of client management software for local-area networks, has added support for new platforms, as well as improved remote control and multiserver support, to its flagship product.

In addition to the Novell, Inc. NetWare LANs that it previously supported, LANlord 2.0 can now provide centralized management of DOS and Windows clients on IBM's LAN Server, Microsoft Corp.'s LAN Manager and other NetBIOS-compatible networks. It features a wide range of desktop management applications, such as software metering, PC inventory, virus detection and configuration information, which are all launchable from a single Windows interface. The product, shipping now, starts at $2,495 for a 50-user license.

New support for multiple LANlord servers allows for centralized management of desktops across multiserver, enterprisewide networks. A new Simple Network Management Protocol (SNMP) proxy agent will allow LANlord 2.0 to report to SNMP-capable management consoles, such as Hewlett-Packard Co.'s OpenView or Sun Microsystems, Inc.'s SunNet Manager. LANlord 2.0 can also be launched from within Novell's Network Management System.

Cost factors

According to Forrester Research, Inc., it costs an average of $1,270 per user per year to support a 5,000-user LAN internetwork. Of that amount, $750 is spent on routine administration.

Remote control

LANlord 2.0 now provides automatic alert-forwarding capabilities that the vendor said support all prominent messaging formats, as well as electronic paging. Microcom has also added integrated remote control, based on its Carbon Copy for Windows product, to LANlord 2.0.

Beta-test users said they were impressed with LANlord 2.0's remote control capacity. "LANlord's ability to edit files remotely will be a major asset to our help desk technicians," said Don Meyers, a systems analyst at Morgan Keegan & Co., a brokerage firm in Memphis.

"LANlord lets our technicians verify remote configurations and modify user system files remotely, in the background, without interrupting our users," said Thomas Winbush, a technical support manager at Plaza Savings and Loan in Santa Ana, Calif.

Too close for comfort

The LAN-based desktop management arena in which LANlord competes has become even more crowded lately, with Saber Software Corp. and Intel Corp.'s networking division, releasing desktop management products in the last six months.

To boost its presence, Microcom signed an agreement with IBM whereby the two companies will cooperate in integrating LANlord into IBM's LAN NetView Manage distributed management platform. Under the agreement, Microcom will develop a new LANlord NV product, which will use IBM's Presentation Manager graphical user interface and support OS/2, as well as DOS and Windows workstations. The new OS/2-based product is expected to ship late this year.

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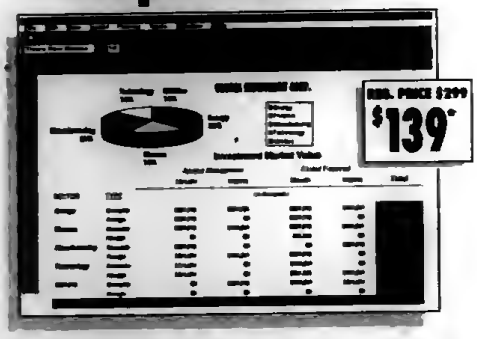

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Reach cements licensing deal to strengthen work-flow focus

Pact provides access to electronic-mail software

By Michael Vizard
SUNNYVALE, CALIF.

As part of an effort to concentrate its activities on work-flow software, Reach Software Corp. has signed a pact with CE Software, Inc. in Des Moines, Iowa, under which Reach will license its electronic-mail software for Windows clients running Novell, Inc.'s NetWare operating system.

According to Reach Chief Operating Officer Kim Peyser, the deal makes sense for both companies because Reach needs to focus on developing work-flow software that will work across multiple environments, while CE Software will use Reach's technology to develop a Windows version of its QuickMail for Novell's Message Handling Services.

"Our heritage is primarily work flow, and the price per seat of E-mail packages is coming down, so it makes sense for us to partner with CE Software. And they needed a Windows E-mail package that supports MHS," Peyser said.

Under terms of the deal, both Reach and CE Software, which is one of the leading providers of E-mail software on Macintosh systems, will work together to add support for electronic forms, rules-based routing, calendaring and scheduling, and imaging on top of QuickMail.

Bundle deal

Reach also recently signed a separate marketing deal with Watermark Software Inc. in Burlington, Mass., under which Reach will bundle Watermark imaging software with its WorkMan work-flow software.

As a result, CE Software will focus on enhancing QuickMail, while promoting Reach's WorkMan software as a work-flow solution that will be enhanced by "time-centric" services, which will be jointly developed by Reach and CE Software, according to CE Software President Ford Goodman.

These features should be available in the next major release of QuickMail, which is due in the next year, Peyser said.

"We're basically going to provide the same feature set that you would see in Beyond Mail or CC:Mail," Peyser said.

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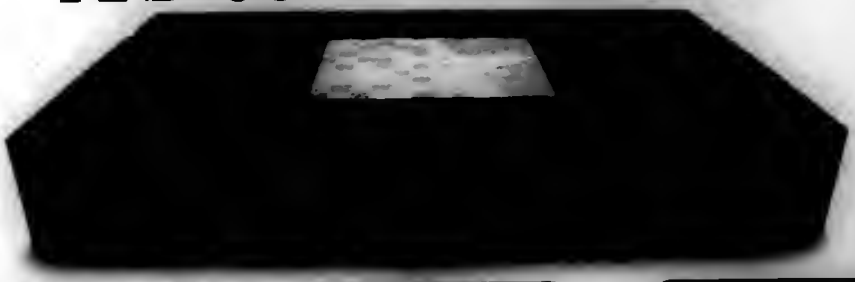

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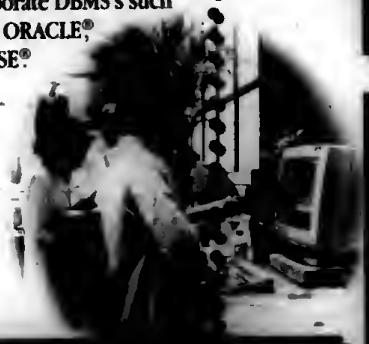

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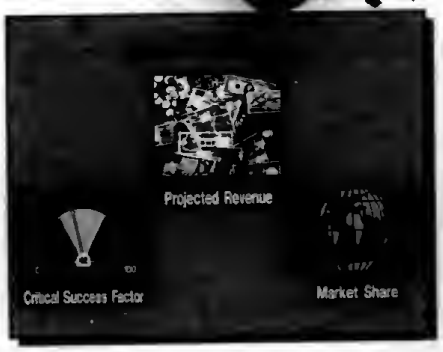

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Minicartridge storage

Demand high for low-cost tape backup

By Stephen P. Klett Jr.

Corporate mandates to "do more with less," coupled with rapid capacity expansion on the desktop, have kicked off a dramatic increase in demand for low-cost tape backup, especially for minicartridge tape drives.

According to a report from Peripheral Strategies, Inc., a market research firm in Santa Barbara, Calif., 3.5 million tape drives, including 5¼-in. data cartridge, 3½-in. minicartridge and 3½-in. data cassette, will ship in the U.S. in 1993. Of these, 2.5 million will be minicartridge drives, which marks a 60% increase over last year.

Minicartridge sales represented roughly 75% of all tape storage units sold in the PC, PC-LAN and midrange markets during the last year, according to the report. The majority of minicartridge units being sold are 120M- to 250M-byte units, which start at about $200.

Price is the No. 1 factor driving sales, according to Dennis Casey, an analyst at Peripheral Strategies. Casey said minicartridge drives are being bought primarily for use as high-capacity storage for a single PC or as low-end storage for small workgroups.

"Minicartridge has pushed into the real affordable range for individual PCs," Casey said. "For storage in this price/performance range, there really aren't any other choices right now."

Minicartridge drives top out at approximately 700M bytes of storage capacity for roughly $1,700, data cartridge drives at 2G bytes for $4,000 and data cassette drives at 600M bytes for $2,500.

Speed considerations

While price is a primary factor spurring his company's use of minicartridge drives, Joseph Trickey, PC coordinator at Stratton-Cheeseman Management Co. in East Lansing, Mich., said speed is also important. "The cost/dependability ratio is such that we really like [minicartridge] backup ... but it's also faster than using disk, which means less time is spent accessing data, which translates into money," Trickey said.

Stratton-Cheeseman uses a mix of about 20 internal and external minicartridge tape drives from Mountain Network Solutions, Inc. and Colorado Memory Systems, Inc. in the 40M- to 120M-byte range to support approximately 80 IBM PC users.

Trickey said they bought two drives last year, and he is pushing for more. "We have found them to be very successful.... They produce more secure backup than diskettes."

In addition to price, Peripheral Strategies said, the following factors are also driving tape drive growth:

- Explosion in capacity demands caused by new high-capacity applications running on Windows.
- Windows' instability with various programs/revisions, which has exacerbated the need for backup.
- Aggressive pricing on minicartridge drives. Casey said vendors such as Colorado Memory Systems and Archive Technology, Inc. have announced 30% to 40% price cuts during the past six months.
- Development of potential new markets in the Americas, Europe and Asia.

Peripheral Strategies estimated that tape-drive shipments will peak at 5.4 million in 1995 before gradually tapering off.

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[redacted]

Modems

Best Data Products, Inc. and CompuServe, Inc. have introduced the "Gold Bundle," a high-speed modem package that combines a CompuServe Information Service Introductory Membership Kit in its new Windows format, with Best Data's 14.4K bit/sec. fax/modems.

Features for the product include free technical support, a communication and fax software program for both Windows and DOS and a lifetime warranty option.

The internal version of The Gold Bundle costs $289, and the external version costs $329.

▶ *Best Data Products*
21800 Nordhoff St.
Chatsworth, Calif. 91311
(818) 773-9600

Storage

Advanced Digital Information Corp. (ADIC) has announced the Storage Docking System, a Small Computer Systems Interface (SCSI)-based storage system that was designed in two-, four- and six-bay configurations.

According to the company, the system offers users on-site configuration of high-speed disk and digital audiotape drives for network storage needs.

Enclosures for the system are ready for front loading of carrier-mounted ADIC SCSI drives and include SCSI buses and power supplies. SDS is available for Unix, OS/2 and Novell, Inc. NetWare operating environments.

Pricing for the two-, four- and six-bay units are $750, $1,150 and $1,550, respectively.

▶ *ADIC*
14737 NE 87th St.
Redmond, Wash. 98073
(206) 881-8004

Legacy Storage Systems, Inc. has announced the Legacy SmartArray, a product that is part of the company's disk array family.

According to the company, Legacy SmartArray can accommodate up to nine half-height disks configured as a redundant arrays of inexpensive disks (RAID) Level 0, 1 or 5 disk array, with a total storage capacity of up to 12.6G bytes. Visual messages and audible alarms are provided to indicate power supply, storage device or fan failures, and abnormal temperature fluctuations are reported by temperature sensors.

Prices start at $7,460.

▶ *Legacy Storage Systems*
25 South St.
Hopkinton, Mass. 01748
(508) 435-4700

Micro-to-host

Server Technology, Inc. has released the Remote Power On/Off+ AUX, a telephone-activated remote power control product that detects incoming telephone calls and turns on power for remote host PCs.

According to the company, the product enables users of remote control software to have access to remote home/office PCs that are not kept running 24 hours a day. Three operational modes are offered: the Remote Power Switch Mode, the AUX Port Mode and the Reboot Mode.

Selectable features such as On Hook Delay Time and Power On Ring Count are also provided. The product is compatible with all standard modems and PC systems and with a variety of communication software, the company said.

The Remote Power On/Off + AUX unit comes equipped with a companion intelligent Power Module and cables; it costs $169.95.

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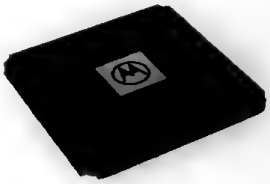

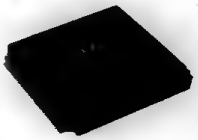

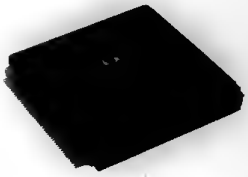

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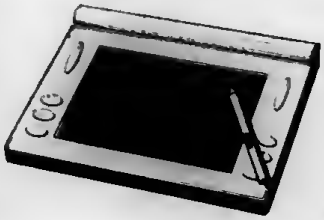

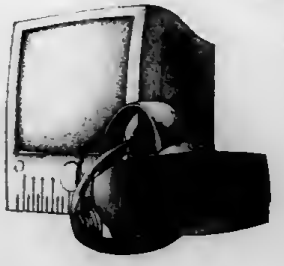

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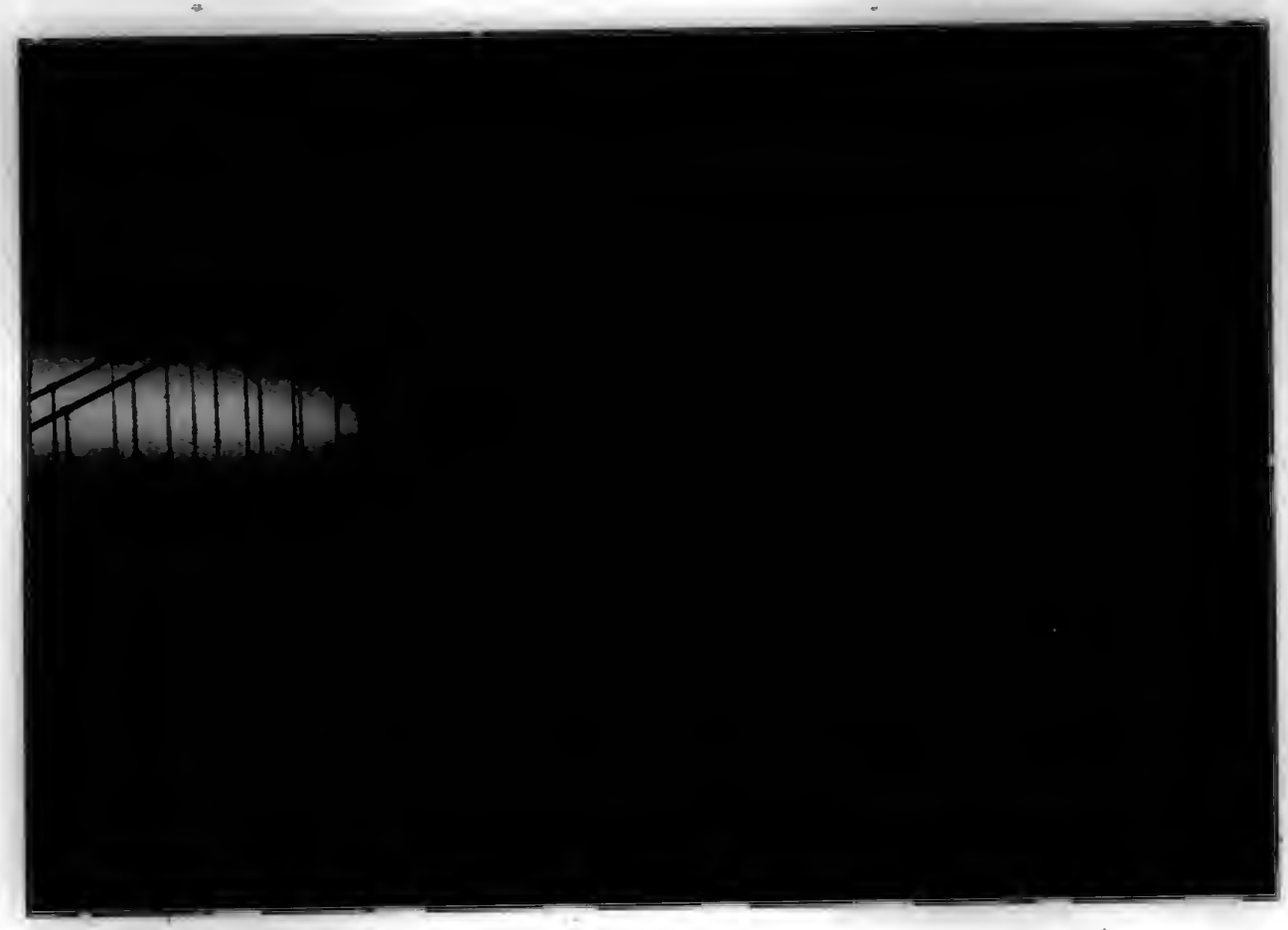

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Forum agrees on frame-relay scheme

By Joanie M. Wexler

The Frame Relay Forum has placed a significant feather in the networking industry's interoperability cap. The forum will soon announce that its members, which include most carriers and router, front-end processor and wide-area data switch vendors, have come to terms on a common way to wrap data communications protocols into a frame-relay packet.

The consensus means that any vendor's network equipment osing the scheme can interoperate with any other compliant device over a frame-relay network, explained Alan Taffel, Frame Relay Forum president and vice president of marketing at Alcatel Data Networks in Reston, Va. The agreement should translate into products incorporating the commoo technology later this year, he said.

Frame relay is a young wide-area oetwork technology optimized for data by combining the efficient statistical multiplexing and port-sharing capabilities of X.25 technology with the high speeds of time-division multiplexing. Frame relay, which can be used in both private or public networks, has about 290 companies subscribing to public services today, according to Vertical Systems Group, a consultancy in Dedham, Mass.

In vogue

Frame relay looks to be growing in popularity. Late last month, for example, regional Bell telephone company US West Advanced Communications Services said it has more than 400 ports deployed via 30 frame-relay contracts. The firm said it has deployed frame relay in 40 metropolitan areas and statewide in three of the 14 states in its region.

Proprietary ways

To date, different vendors have used their own methods of packaging protocols such as Novell, Inc. IPX, Internet Protocol, IBM Systems Network Architecture and Digital Equipment Corp. DECnet in frame-relay "envelopes." Performing these functions in a standard way will open the door to communications among the different devices, a development that will likely benefit carriers and user firms building private frame-relay networks the most. Firms subscribing to a public service can simply let the carrier worry about equipment compatibility.

The forum's common technology will also yield better data-transfer performance to user companies running multiple protocols but using just one vendor's equipment, according to Taffel. This is because the forum's agreement also includes a mechanism for identifying which protocol is contained within a given frame, he said.

Today, even if a frame-relay user runs the same vendor's router at each end of a link, the router has no way of knowing what protocol is in the frame, he said.

"This leads to a tremendous amount of overhead in the router to determine what protocol [is in the frame]" before processing the data and forwarding the packet to its local destination.

Users narrow E-mail product lineup

Firms struggle with cost, complexity of supporting disparate systems

By Lynda Radosevich

Peter Donaghy, manager of information systems at Hughes Aircraft Co., did not know that electronic mail would evolve into a strategic tool. Faced with end users who wanted to send E-mail from independently sprouted local-area networks to other end users on different systems, his IS department tied together 10 different E-mail systems using translation software called "gateways."

Now Donaghy is wrestling with a system that is too complex, and therefore, expensive, hard to manage and less than perfectly reliable. Although new E-mail integration products are being announced almost weekly, Donaghy hopes to alleviate integration problems, in part, by consolidating 10 E-mail systems into three, he said.

Hughes is typical of large companies that linked together disparate E-mail systems that can include established host systems and grass-roots-grown LAN E-mail. In a May 1993 survey of 341 companies by the *Computerworld* Database Division, 50% of the respondents said they were supporting more than one E-mail platform, and 53% of those said they have already connected the disparate systems.

To lower costs and ease system complexity, many of these users are now taking a more formal approach to migrating from host to LAN mail, in part by narrowing the products used.

Since "the biggest cost of LAN E-mail is servicing so many packages, many managers are looking to give their end users one to two choices, rather than a dozen," said Walter Ulrich, a consultant at Arthur D. Little, Inc.'s Los Angeles office.

E-mail is cheaper

The cost to send a two-page letter by typical methods is:

E-MAIL	$.26
U.S. MAIL	$3.30
FAX	$9.74
COURIER	$12.80

Other costs include materials such as paper and thermal paper, processing and labor costs; fax transmission costs are included but not fax hardware and maintenance.

E-mail costs include hardware and software but not general LAN or wiring costs.

Source: Creative Network Strategies, Inc., Palo Alto, Calif.

The move is spurred by the desire to reduce support costs, which comprise the main burden of running multiple LAN E-mail platforms, Ulrich said. For example, a firm with six E-mail systems and 10,000 users in eight units requires a staff of 12 people vs. two for a mature host environment, he said.

Those people are needed to handle translation software and hardware, opgrade E-mail software, assist in fixing major problems, service directories and administer overall operations. With salaries ranging from $40,000 to $80,000, the cost of the extra IS support adds up quickly.

Other factors behind the consolidation efforts are the difficulties in maintaining and synchronizing directories and monitoring message delivery.

For example, Chevron Corp. supports 16 types of E-mail on host, Unix and LAN platforms, each with separate management domains. Most management tools are implemented at the application level and are not integrated, so error diagnosis and recovery is difficult at best, said Marion Weiler, senior system analyst for E-mail at Chevroo Information Technology Co. in San Ramon, Calif. To circumvent this, Weiler said he hopes to reduce the number of platforms supported.

Other issues driving consolidation include the difficulty of dealing with different addressing schemes and finding mail-enabled applications such as group schedulers that work across the different systems, IS managers said.

Rather than linking together existing platforms and then consolidating from there, some companies plan to ease integration conflicts by migrating all users to one new platform.

Edward Bradt, project leader at Eli Lilly and Co. in Indianapolis said his company has five different E-mail platforms, including host and LAN systems, but he has no plans to "bridge" the LAN E-mail. Rather, as he moves the company to distributed messaging, he plans to standardize his 22,000 E-mail users on minicomputer-based distributed E-mail using Digital Equipment Corp.'s Mailworks software. The minicomputers can support between 1,500 and 2,000 users per server rather than the 75 to 100 supported by a typical LAN server, which will reduce the number of servers requiring support.

Gateway proliferation

E-mail gateways let users of different brands of E-mail exchange messages by performing the protocol conversion between the applications. E-mail integration servers let users connect more than two types of E-mail by receiving mail from an incoming gateway, converting messages to an intermediate format (often X.400), then sending messages out to the appropriate outbound gateways. E-mail integration vendors include the following:

- Alisa Systems, Inc. in Pasadena, Calif.: Proprietary software and E-mail integration software for DEC VAXs.
- DEC in Maynard, Mass.: Mailbus software based on X.400 for VAXs.
- Hewlett-Packard Co. in Palo Alto, Calif.: HP OpenMail, X.400-based integration software for Unix-based systems.
- Isocor in San Francisco: Isoplex X.400-based messaging software for DOS PCs and Unix-based reduced instruction set computing (RISC) platforms.
- OSIware, Inc. in Burnaby, British Columbia: X.400-based integration software for PC servers and various Unix-based workstations.
- Retix in Santa Monica, Calif.: OpenMessaging Solution, integration software based on the X.400 protocol for PC servers and Unix workstations.
- SoftSwitch, Inc. in Wayne, Pa.: SoftSwitch Central, which is IBM mainframe-based, and EMX, an X.400 switch on Unix platforms.
- Wingra Technologies, Inc. in Madison, Wis.: Proprietary E-mail integration software for DEC VAX VMS computers.
- WorldTalk Corp. in Los Gatos, Calif.: WorldTalk 400 for HP RISC machines.

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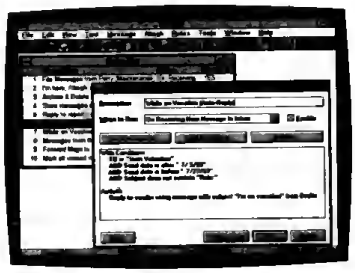

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Tangram points in client/server direction

By Elisabeth Horwitt
RALEIGH, N.C.

With an eye on the needs of downsizing corporations, Tangram Systems, Inc. is launching a client/server version of its host-based software distribution, asset management and data collection software, according to Steve Kuekes, vice president of technology at the company.

Tangram will continue to use an IBM mainframe as the central control point for updating software and distributing data down to PCs on local-area networks, Kuekes said. However, new software will enable popular LAN systems, such as Novell, Inc.'s NetWare, to communicate directly with the mainframe to download the data or software and then distribute it to clients.

Follow-on announcements will put LAN administrators on LAN workstations more directly in control of software distribution and the management of LAN assets, Kuekes said. The client/server software will run in familiar LAN environments so that LAN administrators can control and manage the system without becoming mainframe experts, he added.

Tangram's strategic move to the client/server environment was a key reason behind the company's recent decision to take back the worldwide marketing rights to AM:PM from Systems Center, Inc., Kuekes said. Systems Center acquired those rights in September 1992.

Systems Center, which was acquired last month by Sterling Software, Inc., seems to be in a state of flux over what to do with its mainframe-based network and system management product, Net/Master, Kuekes said. While Systems Center was giving Tangram the worldwide market exposure it wanted, "We decided they would not provide the focus we want" on the client/server market, he added.

Tangram is now looking for partners, but more from a technology than a marketing point of view.

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Briefs

Brokerage firm net

A dozen Wall Street brokerage firms, including Merrill Lynch & Co., Salomon Brothers, Inc., and Morgan Stanley Group, Inc., have agreed to link to a new electronic trading network called the Intermarket Trading Network. The new network, developed by Merrin Financial, Inc., was designed to allow brokerage firms and money managers to execute trades and update all clearing and trade processing systems simultaneously.

T3 speeds on Internet

Internet access service provider Performance Systems International, Inc. (PSI) said last week it is upgrading its links in the Northeast from T1 to T3 speeds with the capability to run Asynchronous Transfer Mode (ATM) traffic. ATM traffic is voice, data, image or video formatted appropriately for time-sensitive applications. The initial rollout between Washington, D.C., and New York is slated to take place this month and next month. ATM switches for the PSI network are being supplied by start-up Cascade Communications, Inc.

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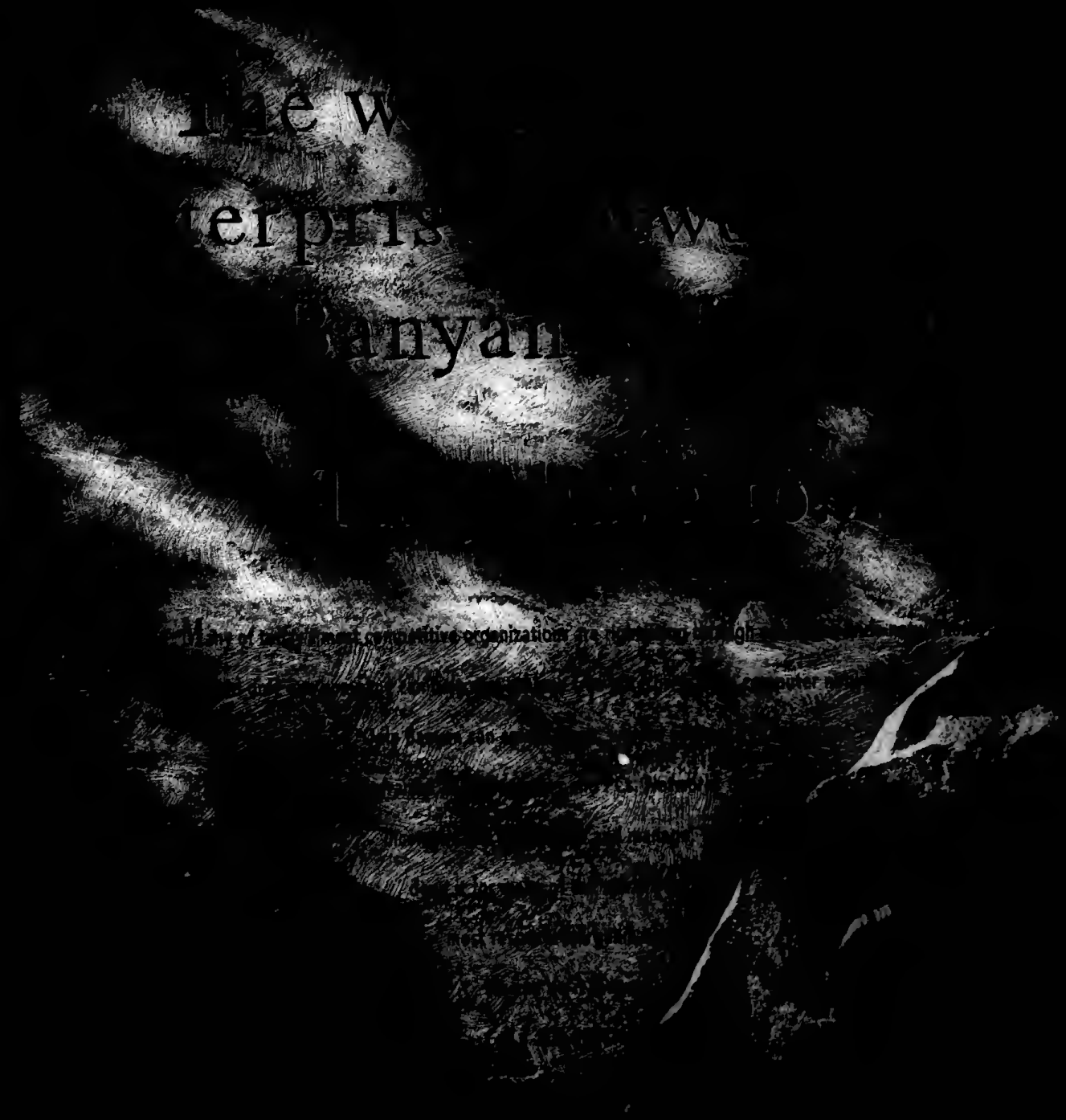


Fiber to make skies over new airport more friendly

By Joanie M. Wexler
GSSVEB

■ The first new major airport to be built in this country in 23 years is relying on more than a million feet of redundant fiber-optic cabling to haul critical air traffic control information around an area larger than the state of Rhode Island.

The Denver International Airport, scheduled to open in December with the goal of becoming a springboard to the Pacific Rim, is slated to have its Racal-Datacom, Inc. Premnet 5000 backbone in place at the end of next month, according to Chuck Krone, vice president of Chicago-based Midwest Corp., the prime fiber contractor on the huge Federal Aviation Administration (FAA) project.

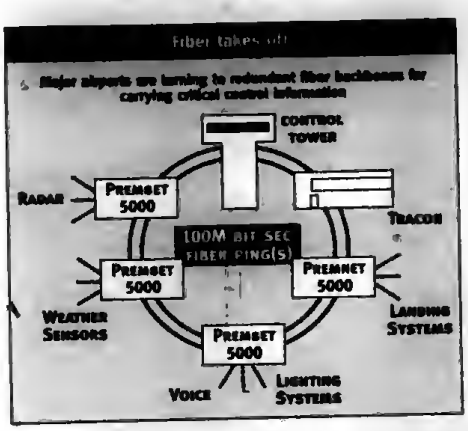
The Premnet boxes — of which there will ultimately be 70 in the Denver installation and 12 in another FAA backbone endeavor at Los Angeles International Airport — collect voice and data from a variety of sources such as on-runway lighting systems and weather sensors, as well as voice from the telephone network and radio channels. The multiplexers merge this traffic onto Premnet's high-speed (100M bit/sec.) fiber link and transport it to the control tower, Krone said (see diagram).

The consolidated information ensures that air traffic controllers have a total picture of airport activity and equipment status so they can keep airplane takeoffs and landings running like clockwork. In fact, thanks to automation, Denver is slated to become the first airport where three planes can land simultaneously in zero visibility, Krone said.

Not the only game

Racal-Datacom competitors in the fiber multiplexer arena include Fibermux Corp. in Chatsworth, Calif., and Fibronics International, Inc. in Hyannis, Mass. The vendors' boxes allow users to go beyond the capabilities of FDDI — albeit in a proprietary fashion — to add terminal, voice and other traffic to LAN communications, yet still derive the speed and redundancy benefits of the 100M bit/sec. dual, counter-rotating ring architecture.

Like industry-standard Fiber Distributed Data Interface (FDDI) networks, Racal's Premnet sports a dual, counter-rotating ring architecture for redundancy: If fiber is cut, communication loops over to the other cable and resumes in the other direction. However, FDDI transports local-area network traffic only, and airports such as Denver and Los Angeles international consolidate more types of traffic than just the LAN variety.



Safety first

A spokesman for the Los Angeles project stressed the reliability of choosing the 64-channel Premnet backbone, which allows users to allocate specified amounts of bandwidth to certain applications. "We have to have something 100% safe from day one. We're playing with people's lives, and there is no such thing as 'half-safe,'" said Mickey Finn, a former FAA lead project engineer on the Los Angeles project.

Finn estimated that about $350,000 of the project's $2.5 million cost is going for the Premnet upgrade from Racal Omnimux 3200s, which are copper-based multiplexers that will be recycled to "other, lower-density airports."

At Denver International, a pair of Premnet boxes on each of the airport's 12 runways will collect information and feed it into the control tower. Meanwhile, Larus transmitters/receivers dispersed across the airport will carry communications between the tower and airplanes.

From the control tower at Denver, that intercommunication is dumped onto an ITT/Alcatel Synchronous Optical Network (Sonet) fiber network and delivered to a Terminal Radar Control Approach Facility (Tracon) 2½ miles away, which serves other airports, said Paul Poirier, a consultant to the Denver project and project engineer at The Volpe Center, an arm of the U.S. Department of Transportation in Cambridge, Mass.

Sonet is an emerging standard for a fiber-based communications "highway" that carries a variety of network services at speeds that will eventually aggregate into the multiple-gigabit/sec. range. Poirier said the FAA chose Sonet for the airport-to-Tracon link because it will eventually become the standard basis for the public telecommunications network.

Tracon monitors all planes in the immediate area, he explained. Sonet does not play a role at Los Angeles because the control tower and Tracon — which scopes a 60-mile radius — are both on the Premnet backbone, Finn said.

Network management

Rmon, NetView 6000 ranges increase

By Elisabeth Horwitt

While major vendors are providing the broad strokes of the integrated, multivendor network management picture, a feisty band of small third parties has been filling in some important functional details. Two cases in point: recent introductions that extend the range of the Remote Network Monitoring (Rmon) protocol and IBM's NetView/6000.

Technically Elite Concepts, Inc. in Hermosa Beach, Calif., has announced Rmon Plus, which is said to extend the Simple Network Management Protocol (SNMP) local-area network monitoring standard to manage enterprisewide LAN-to-LAN connections.

Rmon is an SNMP management information base that sits on LAN devices, such as network interface cards and routers, and collects data on traffic and error levels for analysis on an SNMP management system. However, the current Rmon is limited in that it handles only the data link layer of network interactions, according to Russell Dietz, vice president of systems development at Technically Elite Concepts.

This means that while Rmon can monitor interactions between two devices on the LAN, when the two devices are on different LANs, Rmon only shows device A speaking to its local router, Dietz said. The ability to trace the interaction between different LAN devices all the way across the internetwork is missing.

Rmon Plus is said to fill in that gap in the SNMP standard by providing RMon systems with the ability to monitor and diagnose protocols at the network link layer, such as Internet Protocol (IP), Dietz said. "With our product you can see device A on one LAN talking to device B on another LAN via the router."

> Rmon Plus is said to fill the gap in the SNMP standard by providing Rmon systems with the ability to monitor and diagnose protocols at the network link level.

One main use for the product is in pinpointing the origin of broadcast storms, which saturate the internetwork bandwidth when one or more devices tries to find other devices around the enterprise. With ordinary Rmon, it is hard to trace broadcast messages to a particular device or interaction once the messages are flooding the internetwork, Dietz said. In contrast, Rmon Plus can show the origination point, what created the original message and the sequence of events between router and end station, he added.

The vendor plans to propose Rmon Plus as a standard to the Internet Engineering Task Force by the end of August.

Coming out this fall will be a suite of applications geared to making it easier for less technical users to make use of Rmon Plus, Dietz said. The current product requires a user to be "mildly sophisticated" in the ins and outs of LAN protocols.

Shipping now, Rmon Plus currently monitors IP, Novell, Inc.'s IPX and Digital Equipment Corp.'s DECnet Phase IV protocols. Support for Apple Computer, Inc.'s AppleTalk and Banyan Systems, Inc.'s Vines is scheduled for the fall.

Rmon Plus is priced at $3,995, including a proprietary, 1960-based hardware platform and 4M bytes of memory.

NetView expander

Diederich & Associates, Inc. in South Pasadena, Calif., meanwhile, has announced NetScript/6000, which is said to enable IBM's SNMP-based network management system, NetView/6000, to manage a variety of non-SNMP and non-Systems Network Architecture devices. Prewritten scripts expand the RISC System/6000-based network management platform's management range to include the following:

- DEC, Tandem Computers, Inc. and Unisys Corp. hosts and IBM's Application System/400.
- Multiplexers and switches from vendors such as Network Equipment Technologies, Inc., Ascom Timeplex, Inc., Infotron Systems Corp. and Data Switch Corp.
- Wellfleet Communications, Inc. routers.

The product is fully integrated with the graphical user interface and functions of NetView/6000, Diederich said.

Available now, an entry-level system is priced at between $5,000 and $7,000, depending on whether it includes IBM host NetView support.

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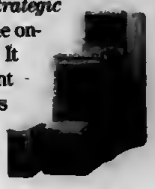

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Human resources: Client/server guinea pig

HR acts as a test bed for new technology, but good results do not necessarily translate to other areas

closer look
Client/server

By Kim S. Nash

Human resources departments are a test bed for many prepackaged client/server software installations, but good results there may not necessarily translate into success in other areas.

Historically, HR departments have been virtually ignored by corporate information systems, according to users and analysts. Now, with off-the-shelf client/server packages available and proven — at least more so than applications in other departments — HR managers are eager to get their hands on new technologies.

IS groups, meanwhile, see HR users as guinea pigs for grander client/server schemes.

Chevron Corp., for example, is methodically plowing through client/server project after client/server project in an attempt to move as far away from the mainframe as possible in HR, finance and other departments, according to Jay Stright, manager of Chevron's HR operations and employee services unit. "As long as all goes well in HR, we'll keep on going," Stright said.

Vendors such as PeopleSoft, Inc., Oracle Corp. and Cyborg Systems, Inc. have offered client/server applications for HR for at least three years, while other areas such as manufacturing and accounting are just beginning to see similar off-the-shelf products.

At Eli Lilly and Co., HR has gained prestige and serves as a model of sorts for other departments getting into distributed computing, said Greg Reynolds, manager of HR IS development.

However, some observers warn that doing client/server in relatively contained areas, such as HR, may defeat the purpose of moving to client/server in the first place.

For example, although financial applications in the client/server model are available from companies such as Oracle and SAP America, Inc., the IS people who make decisions for the accounting department are often not the same folks who choose HR software, said Dick Dionne-Keay, an analyst at Summit Strategies in Boston.

That means that "islands" of client/server can crop up.

"HR is, in some instances, cutting itself off from the rest of the company again," said Brian Summer, worldwide director at the Software Intelligence Group, Andersen Consulting's

Human resources, *page 70*

Still a bit player

Client/server application sales are still dwarfed by host-based application sales

Source: International Data Corp., Framingham, Mass.

At a glance

Some shops prefer to cordon off payroll tasks from the rest of HR processing, contracting with third-party specialists such as Automatic Data Processing, Inc. or Paychex. "You don't have to bother keeping up on ever-changing tax laws that way," notes Lisbeth Green, president of the American Payroll Association in New York.

AS/400 developers eye Unix

By Craig Stedman

Several of the leading application software vendors for IBM's Application System/400 computers have caught the open systems bug in what some analysts view as another sign of the market changes that are making the AS/400's future less certain than its first five years were.

Systems Software Associates, Inc. (SSA), Marcam Corp. and Synon, Inc. all recently made moves into the Unix market or laid out plans to do so. Each has been AS/400-centric, but with AS/400 sales flattening out, the firms are looking elsewhere for growth.

"I'm looking much more at [Unix] for growth than to the AS/400," said Andre Boisvert, vice president of marketing at Larkspur, Calif.-based Synon. "I have to add multiple platforms, and customers are wanting to go to open systems."

"Everybody realizes the market is shifting," added Larry Ford, chairman and chief executive officer of SSA in Chicago. He added that he expects continued increases in SSA's AS/400-related revenue, but said it is "impossible to predict" whether that system will remain the company's leading platform during the long term.

Likewise, Boisvert said he believes the large AS/400 installed base still leaves "lots of market opportunities to feed off of for a long time." But he noted that Synon essentially "hit a wall" in the $50 million to $60 million revenue range as a pure AS/400 software vendor.

Myron Kerstedder, vice president of the midrange computing strategies service at

AS/400, *page 70*

Beyond the AS 400

Open systems product and shipment plans of formerly AS/400-only software vendors

COMPANY	PRODUCT	PLATFORMS	SCHEDULE
System Software Associates, Inc., Chicago	Business Planning and Control System/Advanced Solution (BPCS/AS)	RS/6000, AS/400, HP 9000	March/April 1994 for sales order management functions; rest unspecified
Marcam Corp., Newton, Mass.	Mapics XP	RS/6000, HP 9000, VAX, Alpha AXP, DOS, Windows, OS/2, DOS LANs	Acquired in June 1993; available now

HR lineup

D&B Software and Computer Associates International, Inc. recently announced their first client/server HR modules: HR Stream Flex Benefits and CA-HRISMA, respectively.

CA-HRISMA's price of a flat $65,000 per module — no tiered or per-user pricing — is a departure for CA, acknowledged Carl Hartman, HR product marketing manager. The stance is an attempt to undercut established player PeopleSoft, which charges more than $100,000 per module, Hartman said.

The first CA-HRISMA components — payroll, personnel and benefits — are scheduled to ship in 1994's first quarter, he said.

HR Stream Flex Benefits is the first of three pieces of an HR line designed to be integrated with D&B's Financial Stream series. The product is in beta testing; base price is $68,000.

Integral's InPower series is notable for its imaging abilities, said Summit Strategies analyst Dick Dionne-Keay. InPower was designed to let users scan their own internal forms into the application, a feature unavailable in HR software, he said.

InPower replaces MS-1, Integral's local-area network HR product that is character-based. The first iteration, a version using Gupta Corp.'s SQLBase relational database running on either IBM OS/2 or Novell, Inc. NetWare, is shipping. Prices start at $60,000 for a five-user NetWare system.

Versions for IBM AIX and Hewlett-Packard Co.'s HP-UX are planned for later this year, said Jeff Compert, Integral's vice president of strategic planning.

Oracle plans to upgrade its entire series of HR, financial and manufacturing applications this year, with general availability expected for the fall.

A payroll module that has been selling in the UK is due out this year in the U.S., said Chris Roon, director of strategic alliances for applications marketing. Tightly integrated Oracle packages require Oracle's relational database.

— *Kim S. Nash*

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Wang ports boost open strategy

By Craig Stedman
LOWELL, MASS.

■ Wang Laboratories, Inc. began shipping its Open/image imaging software on Hewlett-Packard Co.'s HP 9000 servers last month, saying it expected to finally deliver a promised work-flow package for the HP line and IBM's RISC System/6000 platform this fall.

Wang, which is trying to turn itself into an open software and services vendor, is also working on porting Open/image to run on Microsoft Corp. Windows NT servers by the second quarter of 1994, with other products following later, said Joseph Tucci, Wang's president and chief executive officer.

Open/workflow will ship simultaneously for the HP 9000 and the RS/6000, probably in October, Tucci said. Open/profound, which catalogs and retrieves multiple types of documents with images, is also due this fall.

At a glance

Projected breakdown of Wang's revenue by business for fiscal '94:
Open systems: 30%
LANs: 15%
VS service: 40%
VS line: 15%

Both products will complete Wang's initial open software portfolio, according to the company. Wang and analysts said Open/workflow, in particular, is being counted on to flesh out the product line beyond the imaging area, where sales growth has been slow.

Wang's imaging revenue fell back below $100 million in fiscal 1993, said Donald Casey, Wang's chief development officer. Imaging remains the company's core technology but is no longer seen "as a sort of stand-alone system," he added.

"Nobody is going to get rich on just imaging alone," agreed Michael Goulde, senior consultant at Patricia Seybold's Office Computing Group in Boston. But, he added, Wang is "talking about enough other things to build off of that," such as Open/workflow.

However, Goulde said other products are now becoming available "that compete effectively with what Wang has." Mike Howard, vice president and office systems service director at Gartner Group, Inc. in Stamford, Conn., added that Wang is late in getting the Open/workflow product to market.

For some VS accounts, Wang's tardiness has made it harder to justify staying with the company. "The software they have was way ahead a year ago but there's more competition now, and the longer it takes to get it out the door, the more there will be," said Ramsay Millar, director of MIS at the British Columbia Tourism and Culture Department in Victoria, British Columbia. Millar shifted most of his information systems functions to Sun Microsystems, Inc. hardware earlier this year.

However, John DaSilva, manager of systems development and database administration at the Gas Research Institute in Chicago, said he views Wang's imaging experience as an advantage in the developing image-based office productivity environment.

Sales of Open/image and the other open software packages are now small, Tucci noted, but he said 80 open systems orders have been booked since Wang filed its reorganization plan in March. "Really, the world's paid attention to us only the last few months," he said.

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Human resources

CONTINUED FROM PAGE 67

market research arm.

The problem is magnified by the fact that discrete client/server programs for manufacturing plants are even scarcer than financial products. "I'm not sure you're going to see people standardize on one or two [client/server software] vendors for all three areas," said Kurt Basler, manager of payroll and HR IS at Transco Energy Corp. in Houston.

Although that might make IS more complicated, according to Basler, users will have to adjust. "It's a new world out there and sure, there will be growing pains with it, but we're just going to have to do it," he said. Transco plans to install Integral, Inc.'s just-announced InPower HR system this month.

Integrating HR, finance and manufacturing across a company in the manner an ideal client/server setup calls for "is just impossible right now," Summer agreed.

The client/server applications market is fiercely competitive now, as distributed computing models begin to take hold. More vendors are popping up every day, and mainframe software makers are porting their systems to Unix and slapping on a client/server label, Summer said.

"The people who write all these packages have to incorporate other vendors' tools to hope to make it," he said, adding that a few vendors have the right idea, even if they are currently considered laggards.

For example, Dun and Bradstreet Software's Stream systems, few modules of which are now shipping, have hooks into third-party electronic-mail packages and provide tools to help users reorganize work-flow processes, D&B said.

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IBM

AS/400 future

CONTINUED FROM PAGE 67

Gartner Group, Inc., a consultancy in Stamford, Conn., said the moves by the software vendors pose at least short- and medium-term problems for IBM since the AS/400 is not yet seen as an open system.

IBM is working to change that by adding Posix support and a better implementation of the Transmission Control Protocol/Internet Protocol, "but the [software vendors] are going in that direction much more quickly than IBM can," Kerstedder said. "For a period of time, the AS/400 sits there by itself."

He said it may take IBM at least three years to fully transition the AS/400 into the open systems space. The machine is not going to disappear, he said, "but the stellar performance of its first five years is certainly going to slow down."

However, Nina Lytton, publisher of the "Open Systems Advisor" newsletter in Boston, has a more positive view. The availability of software on other platforms should assure AS/400 users that they are not locked into that system, Litton said. "There'a more competition, but every cloud has a silver lining."

As part of their open systems plans, both SSA and Synon said that over time they will make full application development environments available for use on networked PCs, as an alternative to their AS/400 tools. "The future of development is PC- and LAN-based," Ford said.

Synon will continue to enhance its AS/400-based Synon/2E development tools, Boisvert said. "But I also have to be smart enough to put my plan together for the next generation."

Synon's object-oriented LAN-based product also may use underlying technology from Hewlett-Packard Co. or Microsoft Corp., rather than continuing with the IBM technology nsed in Synon/2E, Boisvert added. "No longer is Synon just blindly IBM," he said.

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Utilities

Cybermation, Inc. has introduced Version 4 Release 3.0 of its Execution Scheduling Processor (ESP), automated job scheduling and work-load management software for IBM MVS data centers.

According to the company, ESP automates the execution of simple and complex job streams, verifying that all requirements, including conditional ones, are met.

Enquiry and reporting facilities, updating and real-time control are offered with ESP. Improved job monitoring, increased resource management and enhanced security are new to this release.

Prices start at $43,500.

▶ *Cybermation*
80 Tiverton Court
Toronto, Ontario L3R OG4
(416) 479-4611

Phoenix Software international has introduced (E)JES 2.1, an MVS mainframe software product.

According to the company, (E)JES is a Spool Display Search Facility front end for JES3 installations. Release 2.1 features the ability to make global or local operations totally seamless. It offers additional sorting capabilities, the ability to create commands and security enhancements.

Prices range from $15,000 to $41,000.

▶ *Phoenix Software*
Suite 1200
5933 West Century Blvd.
Los Angeles, Calif. 90045
(310) 338-0400

Power supplies

Deltec Electronics Corp. has announced the Advanced Battery Management (ABM) capability.

According to the company, the product was designed to reduce the frequency of battery replacements in uninterruptible power supplies (UPS).

ABM's charging cycle is offered in three levels: fast charging, slow charging and no charging. These capabilities are incorporated into Deltec's PowerRite Pro family of UPS, which protect stand-alone PCs, workstations, local-area network file servers, network nodes and sensitive electronic information against faulty power, the company reported.

Models are available in 400VA, 1000VA, 1440VA, 1920VA and 2200VA capacities.

Pricing for the PowerRite Pro begins at $449.

▶ *Deltec Electronics*
2727 Kurtz St.
San Diego, Calif. 92110
(619) 291-4211

Software application packages

Jobscope Corp. has introduced Jobscopejr, a scaled-down version of its IBM Application System/400-based Jobscope management information software for order-driven manufacturing and service businesses.

Manufacturing management capabilities offered with Jobscopejr include job costing, order entry, engineering, purchasing/receiving, financial reporting and inventory control.

Jobscopejr can also perform job cost accounting, standard bills of material/routing, production bills of material/routing and estimating, quote and proposal management, according to the company.

The five-user, 10-user and 15-user Jobscopejr systems cost $54,000, $69,000 and $85,000, respectively.

▶ *Jobscope*
Suite 405
355 Woodruff Road
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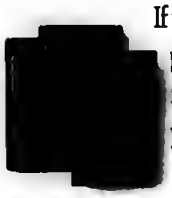

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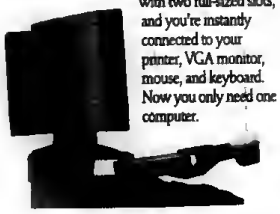

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Baler Software to introduce development tool for Windows

By Michael Vizard and Melinda-Carol Ballou
ROLLING MEADOWS, ILL.

■ Baler Software Corp. plans to deliver this fall a Windows version of its spreadsheet-based development tool that allows users to create applications that can be deployed on other systems using the standard "@" commands that come with most spreadsheet packages.

Visual Baler 1.0 provides a visual programming environment on top of standard spreadsheets

Visual Baler 1.0 will give users a visual programming interface for creating applications on top of Excel from Microsoft Corp., 1-2-3 from Lotus Development Corp. or Quattro Pro from Borland International, Inc. Once created, these stand-alone applications can be run on any Windows system, regardless of whether the system is running a spreadsheet.

Although Visual Baler 1.0 is still in the alpha-testing stage, end users said they are looking forward to a major jump in capabilities in the new environment.

Specifically, Roy Hubbard, manager of chiller conversion and retrofit services at York International Corp. in York, Pa., a supplier of air-conditioning systems for office buildings, said he is impressed by the promised three-dimensional capabilities and the improved memory management functions that are promised with Visual Baler.

Hubbard said he has to run Baler for DOS under expanded memory. The Windows version of Baler will take advantage of the memory management services in Windows to run faster and more efficiently.

Hubbard said he intends to upgrade an application that York uses to analyze the costs of upgrading air-conditioning systems from which York is removing environmentally harmful chlorofluorocarbons.

"The reason we first got involved with Baler is because I wanted to create an application and send it out without having to have all our offices own spreadsheet software," Hubbard said.

Full of features

Visual Baler also allows users to import existing worksheets, which are created with programs such as 1-2-3, to slash development time. And it includes tools such as automatic Help file creation not found in many spreadsheets. Also included are a project manager, spreadsheet editor, debugger, Microsoft Help compiler

Baler, *page 78*

Object technology

OMG strives to create on-line object brokerage

By Jean S. Bozman

Objects for sale! Objects for sale!

If you were to walk down America's information highway in the year 1996, it is very likely that you would hear that refrain, industry analysts predicted.

Once the world has enough objects to trade, it will do so electronically, vendors and analysts agreed. The hottest debate is not over *whether* object bazaars will emerge; but rather it is over how much users should pay and how the revenue should be collected.

Share and share alike

"Most of us in object technology believe objects are the best hope we've ever had for the software component industry," said David Taylor, president of Enterprise Engines, Inc., a Redwood City, Calif., firm that consults on business analysis and application design.

"Every company should not have to reinvent the wheel to be able to assemble software, rather than having to 'build it from scratch,' he said.

Yet that is exactly what users have had to do: American Airlines built an object-oriented command-and-control system at Dallas/Fort Worth Airport, and Tampa, Fla.-based Kash 'n Karry Food Stores, Inc. built its own C++-based retailing applications.

Although software vendors have built their own object class libraries for user interfaces and network management systems, a relatively small number of object class libraries are available.

But if the notion of an object-oriented version of a Sears, Roebuck and Co. catalog is appealing to many users, several formidable challenges must first be met: creating a common object "syntax" for a common language and "semantics" for common meaning.

Otherwise, C++ objects will not be able to talk to ParcPlace Systems, Inc.'s SmallTalk or Digitalk, Inc. objects, said Taylor, who has authored textbooks on objects.

The Object Management Group's (OMG) Common Object Request Broker Architecture standard will help solve that problem, Taylor said. Beyond that standard, an object-trading infrastructure must be created, perhaps modeled on electronic bulletin boards or store catalogs, he said.

Obstacles to face

John Rymer, an analyst at the Patricia Seybold Office Computing Group in Boston, predicted, however, there will still be vendor

Object brokerage, *page 79*

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Rational rolls out Ada environment

By Gary H. Anthes
SANTA CLARA, CALIF.

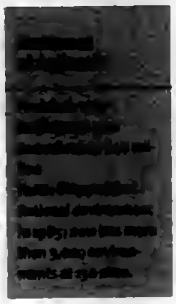
Rational introduced its next-generation Ada development environment, an open-system implementation that no longer requires the use of Rational's proprietary hardware.

The Ada software engineering environment, called Apex, can run on IBM's Unix-based RISC System/6000s as well as on Rational's R1000 minicomputers. Later this year, Apex will be available for Sun Microsystems, Inc. Scalable Processor Architecture computers.

Apex enables editing, program browsing, compilation, debugging, configuration management and version control. It is suited for team use, Rational said.

IBM Federal Systems Co. is using the earlier version of the development environment on Rational hardware to develop real-time air traffic control software for the Federal Aviation Administration (FAA), which is expected to require more than 2 million lines of Ada code. It is also developing parts of the system directly on RS/6000s — where the application programs will run — using IBM's Ada compiler.

IBM is now testing the new Rational Apex directly on RS/6000s to gauge the impact of a possible change in development approach in the middle of the huge project. "Rational is a wonderful environment for developing large amounts of code," said Hope Walker, manager of system development environments. "It has very high productivity, excellent debugging capabilities and having that available to us on the RS/6000 is what we're looking for."



"Our developers had to learn two environments — Rational and RS/6000," said IBM's Tom Trueman, support systems program manager for the FAA's Advanced Automation System. "They had to port code over and get it compiled with a different compiler and get it debugged again."

"Now they can learn one hardware environment and one operating system, and Rational is a set of tools that our people are already familiar with. That makes it very attractive," he said.

Apex features include the following:

- The product uses the Open Software Foundation's Motif tool kit for menus, dialog boxes, customizing options and the like.
- In a process called "persistent intermediate representation" Apex maintains a permanent, detailed file of information about users' software in an object-oriented repository.
- "Optimal recompilation" allows automatic recompilation of lines of source code affected by changes elsewhere without having to recompile entire source files.

Apex is priced at $21,000 per user.

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Baler app tool

CONTINUED FROM PAGE 75

and distribution file optimizer. It provides an application framework so that users do not need to write routines such as "file open" and "save" or code data structures or menu systems.

Specifically, Visual Baler is made up of workbooks with tabbed pages that represent separate sheets in a 3-D spreadsheet.

After the application is completed, users can bind the application into a distributable application. It offers a forms layer so that spreadsheet objects and Windows controls can be combined to create input screens.

Visual Baler is expected to ship in September and will be priced at $495, including a royalty-free distribution kit.

Neuron Data broadens tool base

By Melinda-Carol Ballou

Neuron Data, Inc. is announcing this week Smart Elements, an object-oriented development environment for creating knowledge-based applications with graphical user interfaces (GUI).

"Smart Elements extends the continuum of the application development environment to bring in business logic and business modeling," said Alain Rappaport, president of Neuron Data.

Smart Elements bundles Neuron Data's Nexpert object development tool with a cross-platform GUI design capability. These two elements are united by an extensible script language that lets developers define the behavior of the application interface and link screen elements to application objects.

Using Smart Elements, developers can more rapidly and easily build graphical knowledge-based systems that are portable across platforms, the company said.

Making a profit

Neuron Data posted pretax profits of 16% for the fiscal year ended in March, with 27% growth in revenue during the previous year.

Message make-over

New with this combination of products are improved messaging capabilities that allow developers to attach methods to classes and objects. This enables easier reuse of code and maintenance as well as faster development, officials said. Users are able to broadcast parameterized messages to multiple objects and internal or external methods as well as multiple inheritance paths.

Smart Elements also features a graphical network browsing and monitoring facility, which allows developers to review the broadcast process visually.

Smart Elements builds on Neuron Data's announcement last month of a client/server tools strategy. At that time, the company announced a Data Elements Architecture that consists of GUI tools, data access rules and object tools that are linked via three integration layers.

The integration layers consist of a visual editor, a message-based script language (which is also used with Smart Elements) and third-generation language programming facilities.

Smart Elements is priced at $5,000 and will be shipping this month for the Macintosh, Hewlett-Packard Co.'s 9000 series, Sun Microsystems, Inc.'s SPARCstation, Digital Equipment Corp.'s RISC/Ultrix, IBM's RISC System/6000 and Silicon Graphics, Inc.'s workstations.

Netlogic targets developers with common macro language

By Melinda-Carol Ballou
NEW YORK

While Microsoft Corp. pursues a proprietary strategy with its Visual Basic macro language [CW, June 28], Netlogic, Inc. is shipping ProMacro, which specifically targets application developers and independent software vendors.

ProMacro will allow software companies to provide a utility that users can employ to create their own enhancements to software products.

ProMacro is a superset of Basic, and it offers integration of a full range of Basic operations, functions and data types. Its built-in macro language can automate users' routine tasks, customize interfaces or enhance integration with other products, company officials said.

"The need to do this is indicative of an industry trend toward more customizable, off-the-shelf applications," said Michael St. Hippolyte, executive vice president at Netlogic.

Made of modules

ProMacro is modular in structure, and its front end consists of an integrated source code editor and debugger. The back end consists of two modules: a compiler and a runtime engine.

The modularity of ProMacro's design gives developers the flexibility to incorporate ProMacro into their applications, company officials said.

ProMacro is compatible with the core syntax of Microsoft's Visual Basic and offers support for the Windows user interface as well as access to Windows Graphic Device Interface to display bitmaps and text and to draw shapes. In addition, it supports Dynamic Data Exchange and allows access to Dynamic Link Libraries. Developers can also extend the Basic interface by adding new keywords.

St. Hippolyte differentiated ProMacro from Microsoft's macro language.

"Ours targets more of internal Basic to provide specialized capabilities to customize and automate applications, and Microsoft's handles more of the external functions to glue applications together," he said.

"We're all moving toward an object-oriented future, where the real use of a macro language will be to hold different applications and objects together and to customize products so that what end users ultimately see is different than what came out of the box [originally]."

Netlogic will also ship an end-user development tool this fall. Dubbed Cezanne, it will compete in the Visual Basic market, offering an object-oriented, rapid application development environment.

Cezanne will be priced at $495, and ProMacro is priced at $49,500 for an unlimited-use license.

Object brokerage

CONTINUED FROM PAGE 75

spheres of influence in the object world, including object classes from Microsoft Corp., Borland International, Inc. and IBM.

Payment is another obstacle. Some have suggested a pay-as-you-go arrangement, with an object utility that summarizes per-use charges. However, collecting information on software use, perhaps through metered charges, is problematic. Another way would be to distribute objects electronically for a onetime software license fee, as is done for today's shrink-wrapped software.

At last month's Object World, the OMG proposed an on-line object brokerage that would electronically distribute objects ranging from screen widgets to industrial-strength applications. That proposed brokerage has been approved by the 24-member OMG board, but its format has not been finalized.

However, OMG Chief Technology Officer Richard Soley said existing on-line information services may provide a home for the OMG object brokerage as early as this fall.

"We're hoping that it will improve the economies of software development," said Sam Greenblatt, chief technology officer at Candle Corp. in Santa Monica, Calif., an OMG member. "The main reason this whole thing was put together was that object technology's going to stall unless there's a way to improve the economics and to attract a growing audience to it."

Greenblatt said the goal of the OMG brokerage is to have 2,000 active subscribers" by 1995. The object brokerage is intended to create more demand for object-oriented software, he said.

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The SAS/C C++ Development System is fully compatible with the AT&T 3.0 release of the C++ language with the exception of template support. It implements the familiar constructs of the C++ programming language—including in-line functions, operator and function overloading, references, and free store management—providing a robust and productive applications development environment.

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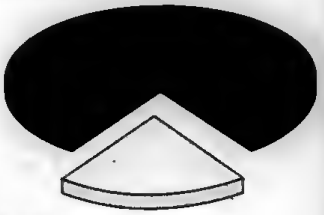

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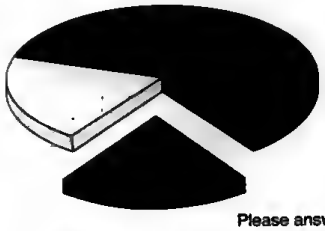

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- 65. Communications Systems/Public Utilities/ Transportation
- 70. Mining/Construction/Petroleum/Refining/Agric.
- 80 Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
- 90 Computer/Peripheral Dealer/Dist./ Retailer
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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31 Programming Management, Software Developers
- 41. Engineering, Scientific, R&D, Tech. Mgt.
- 60. Sys. Integrators/VARs/Consulting Mgt.

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- 11 President, Owner/Partner, General Mgr
- 12. Vice President, Asst. VP
- 13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT
- 51 Sales & Mktg. Management
- 70. Medical, Legal, Accounting Mgt.

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- 90. Other Titled Personnel

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Application development tools

Semaphore has introduced Atriom, an interactive graphics object-modeling tool designed for creating, browsing and managing object-oriented applications.

Developed for users with C++ language programming and object technology, Atriom offers drawing capabilities that capture complex designs such as object modeling.

According to the company, the tool can read existing programs and can display a detailed graphical representation of their component parts and their interrelationships.

Atriom costs $795.

▶ *Semaphore*
800 Turnpike St.
North Andover, Mass. 01845
(508) 794-3366

CenterLine Software, Inc. and Visual Edge Software Ltd. have announced ViewCenter for Motif.

The product is based on UIM/X 2.5, Visual Edge's graphical user interface (GUI) builder and includes integration with CenterLine's CodeCenter and ObjectCenter Unix programming environments.

With ViewCenter for Motif, users can interactively create, test, modify and generate code for the user interface portion of their applications, the firms said.

Support for Release 1.2 of Motif is provided, and reusable GUI objects can be created because ViewCenter for Motif generates C++ user interface code and GUI-class object components.

The product costs $2,995.

▶ *CenterLine Software*
10 Fawcett St.
Cambridge, Mass. 02138
(617) 498-3000

Intelligent Environments, Inc. has announced SQL/Workbench Version 2.1, a development tool.

According to the company, the product provides high-performance static SQL capabilities for client/server applications hobbled by poorly performing dynamic SQL.

The product offers a mix of multithreaded static SQL, high-level team programming and maintenance facilities and a language-independent architecture.

Version 2.1 can be used to deliver static SQL access plans for IBM's Systems Application Architecture databases and adds optimized tuning for IBM's Distributed Database Connection Services/2 and DB2, the company said.

Licenses cost $8,400.

▶ *Intelligent Environments*
2 Highwood Drive
Tewksbury, Mass. 01876
(508) 640-1080

Languages

Liant Software Corp. has announced RM/Cobol-85 for Windows.

According to the company, the product lets users run existing RM/Cobol-85 applications under Windows without recompiling or changing any existing code.

RM/Cobol-85 for Windows takes advantage of Windows features such as mouse-driven operation, a graphical user interface and pop-up windows.

Highly portable Cobol applications can be deployed among Windows, Unix, DOS and OS/2, which are the other platforms that Liant supports.

RM/Cobol also features more than 85 predefined buttons and a customizable tool bar.

RM/Cobol-85 for Windows costs $199.

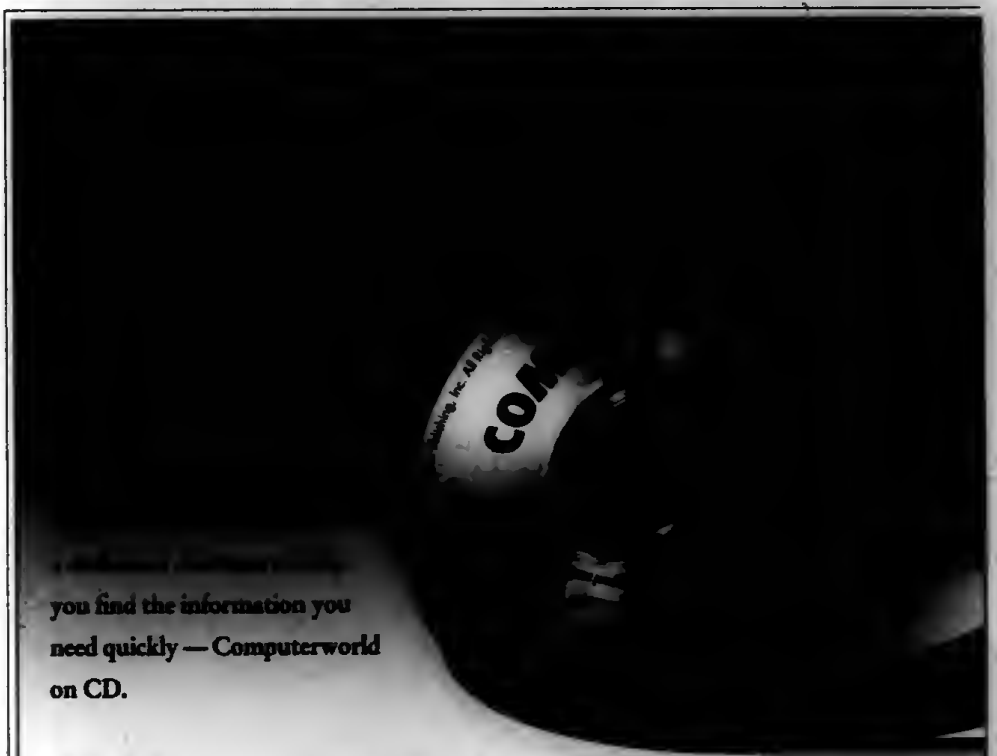
▶ *Liant Software*
Suite 4300
8911 North Capital of Texas Highway
Austin, Texas 78759
(512) 343-1010

Ergodic Systems, Inc. has announced Version 4.5 of the Macro Spitbol, a high-performance string language based on the Snobol4 language.

According to the company, the product is used for file and data conversion, pattern-matching and sorting and retrieval.

A complete package of license, media and documentation for any Digital Equipment Corp. VAXstation costs $395.

▶ *Ergodic Systems*
23666-A Birtcher Drive
El Toro, Calif. 92630
(714) 380-9719



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"The sheer volume of what's in it. Easy access without having to go to a library service."

"It has information not found on Computer Select."

Source: Survey of Computerworld on CD subscribers, May 1993.

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The Salary Spectrum of Top CIOs:

CIO COMPANY	TOTAL PACKAGE	ANNUAL		
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	$703,084	$339,262	$250,000	
[illegible]	[illegible]	[illegible]	575	$1,868
[illegible]	$559,103	$343,750		
[illegible]	[illegible]	$290,000	$203,000	
[illegible]	$414,000	$307,000	$98,180	
[illegible]	$330,023	$208,827	$75,000	$41,860

A few extra cheek the dollar The executives selected for the compensation chart are a sample based on publicly available compensation reports from 1992 proxy statements. An executive's long-term compensation is included to show his annual total compensation, although he is not actually taking home, in cash, those amounts. Restricted stock awards are granted in a dollar amount on an annual basis and then are vested over a period of years as an executive continues at the company. Stock options are granted in a similar fashion. The Other long-term compensation can represent the sale of restricted stock or payouts from other corporate incentive programs. James Marston, for instance, received $94,500 in 1992 from the sale of restricted stock he had been granted in the 1980s.

CONTINUED FROM PAGE 1

in various industries has steadily climbed in the last several years and now ranges from $76,000 to $155,000.

But an expanding group of high-powered CIOs are leaving those numbers in the dust. Based on interviews with information systems executives, recruiters and industry observers, the world of CIO compensation is splitting into two tiers.

The lower tier consists of a large number of CIOs who reflect the industry averages. On top of that, however, rests a smaller, but growing, top tier where compensation in the $500,000-plus range is becoming the norm.

Increasingly, these top-tier CIOs are receiving stock option deals, signing bonuses, annual bonuses and other perks, all of which can exceed more than 100% of their base pay.

SUPER CIO$

"I'll take their salaries," quipped Edward Perlin, president of Edward Perlin Associates, Inc. in New York, a compensation and benefits consulting firm that has been tracking CIO pay at a small number of large corporations for 10 years. His surveys have included companies such as Aetna Life and Casualty Co., American Express Co., BankAmerica Corp., Bank of New York, The Chase Manhattan Bank NA, Chemical Banking Corp., Morgan Stanley & Co., PaineWebber, Inc. and Salomon Brothers, Inc. In 1993, the average cash compensation — which excludes long-term compensation of stock-related payments — at 17 top firms was just above $400,000. Perlin estimates that three or four of the CIOs earned more than $1 million when long-term compensation was included.

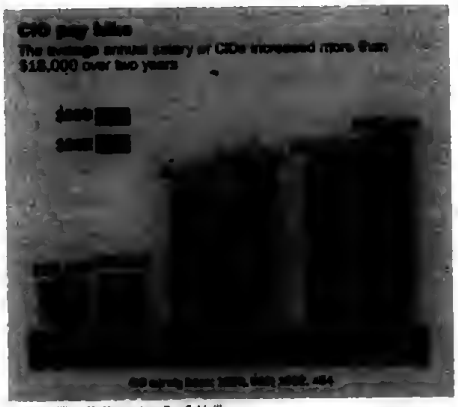
Then there's Ron Ponder, who made a name for himself at Federal Express Corp. and just last month jumped to AT&T from rival Sprint Corp., where he was CIO for a little more than a year. He was not in Perlin's survey, but the 1992 Sprint proxy statement shows that the CIO's total package, including long-term compensation and a onetime bonus, topped $2 million.

A Sprint spokesman said Ponder will actually forfeit a major chunk of that compensation because he resigned before July 6, 1993. AT&T will not say what it was willing to pay Ponder to come on board, and Ponder was not available for comment.

Just three years ago, DuWayne Peterson, then IS chief at Merrill Lynch & Co. and now an independent consultant, was one of the most talked-about executives in the industry because of his million-dollar compensation package. Peterson said CIO compensation continues to improve because the IS chief's job is seen more as an "executive-level" position. And he speculates that at least "a handful" of

CIO pay hike

The average annual salary of CIOs increased more than $18,000 over two years



Source: William M. Mercer, Inc., Deerfield, Ill.

1992 CIO Compensation

	LONG-TERM		MISCELLANEOUS COMPENSATION
$875,000			$867,250
$110,000	22,000		$3,822
	5,310	$94,500	$17,389
$156,125	5,000	$25,000	$34,228
	3,877		$26,132
			$8,820
	12,500		$7,336

[redacted]

Companies typically do not detail [redacted] amounts. But they often include such items as relocation expenses. And the [redacted] category is intended to cover a variety of smaller payouts, with the exception of Ron Ponder, the former CIO at Sprint who was recently named CIO at AT&T. Ponder's miscellaneous compensation includes an $867,250 signing bonus when he joined Sprint, and the remainder covered his moving expenses. (One other note about Ponder: What he will actually realize from Sprint is far less than $2.2 million, based on the terms of his employment contract outlined in the 1992 proxy statement. For instance, the contract specified that Ponder repay his signing bonus, minus tax withholding, if he resigned before July 6, 1993, which he did.)

CIOs, mainly at financial securities firms, are making more than $1 million now.

Today, as Ponder and other top IS chiefs demonstrate, many more CIOs are playing in the big leagues. Industry observers say this top tier of well-paid IS executives has been created by several factors. The more a company considers IS critical to its success, the more the IS chief's compensation will reflect that. Consequently, CIOs at major corporations, particularly those companies that live and die by their information systems, are compensated handsomely.

Perlin says the front-runners in compensation are typically from the financial services industries, with brokerage houses, banks and insurance companies leading the way. But more recently, this trend "is spreading more to other industries, too," Perlin adds.

"The CEO's attitude" toward IS is a big factor in how the CIO is paid, Marston says. And some recruiters agree.

"The ability for a CIO to get to the hallowed executive officer is often a function of how the president perceives [the position]," said Beverly Lieberman, president of Halbrecht Lieberman Associates, inc., a recruitment firm in Stamford, Conn.

Other observers say the high-risk nature of the job is bumping up the size of today's paychecks. With turnover so high — Deloitte & Touche estimated 1992's CIO turnover rate was 17.5%, a 20% jump from 1991 — companies are often willing to compensate well if they believe they've landed a solid executive.

Jay Gaines, president of the recruitment firm Jay Gaines & Co. in New York, says that when it comes to CIOs, "there have been failures and disappointments. So, hiring a really excellent CIO is a very difficult task. In the senior levels, it is put at a premium."

Gaines says his research shows that compensation at major financial services companies, excluding long-term and deferred compensation, ranges between $300,000 and $500,000.

Jay Ward, vice president and chief operating officer at KeyCorp., a bank-holding company in Albany, N.Y., says he believes the turnover rate has changed the compensation game as well.

"The average life in a position tends to be about four or five years," says Ward, whose total compensation package in 1992 topped $500,000. "Salaries are higher because every time you go out to get someone new, you have to pay more."

[redacted]

Source: The Survey Group, Wakefield, Mass.

Another factor, observers say, is the maturing of the IS industry, where more CIOs today have well-known track records and can command big bucks.

In addition to the financial rewards, these top-tier CIOs are typically key players on the executive team. Michael Simmons, executive vice president and CIO at Bank of Boston Corp.; Max Hopper, CIO at AMR; and Charles Bowerman, CIO at Phillips Petroleum Co. all rank within the Top 5 executives at their companies.

In the top tier, the rewards are big, but the downside can be significant. Along with fatter paychecks, executives and recruiters say an increasing percentage of total compensation is coming from payments other than base salary.

The big bucks can come from bonuses tied to corporate profits and individual performance rewards. But the more income derived from at-risk compensation, the more likely an executive could take a big financial hit.

The risks, though, are apparently worth it to many of the big players.

"I don't have any complaints," Ward says, "You have fun doing things; you don't worry about the dollars. I've been lucky. I've got a good boss, too." ■

IDC Insight: An I

INTERNATIONAL DATA CORPORATION

Protecting DASD at AS/400 Si

Sponsored by E

Mirroring has rapidly become the most dominant method for protecting DASD at AS/400 sites. As disk prices continue to decline and users demand higher performance storage subsystems, mirroring's popularity is expected to increase dramatically.

The AS/400's unique storage architecture uses single-level addressability of all storage. Storage can be accessed transparently, creating the appearance (to a programmer) that main memory and secondary storage are a contiguous address space. The fundamental problem with AS/400 storage, however, is that disk files are striped in blocks across multiple disk spindles. If a disk fails, the user loses access to all striped files associated with the data on that device and must refresh the entire DASD farm from tape with data that may not be current.

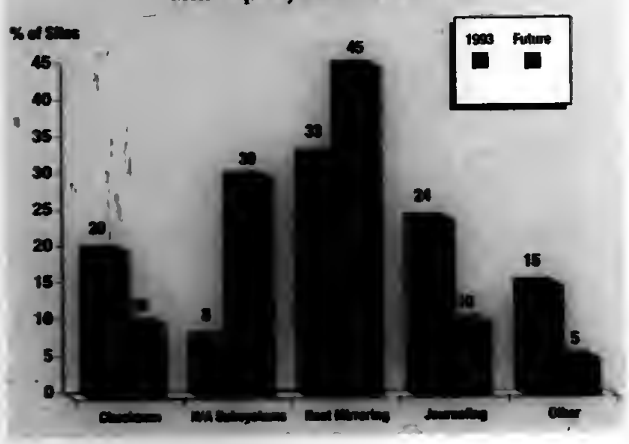
IBM has introduced several features designed to address the drawbacks of single-level storage. In addition to host software that predicts device failures, IBM offers journaling, which stores database changes to a specified disk and allows recovery from the last tape backup. The AS/400 also touts three other features used to avoid catastrophic device failures:

- Checksum protection
- Disk mirroring
- High-availability (H/A) DASD subsystems

Figure 1

Mirroring Is Favored at AS/400 Sites

DASD Protection Method
Most Frequently Used at AS/400 Sites



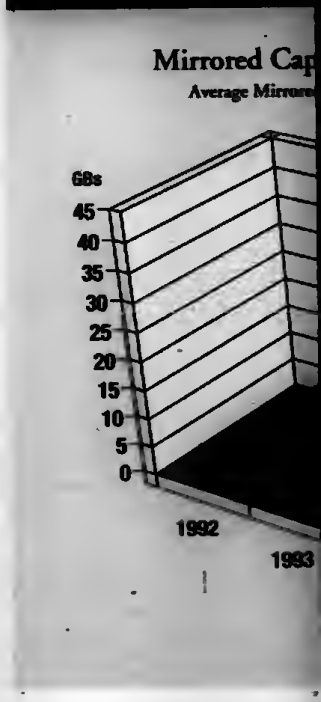
Checksum

Checksum protection constructs "sets" of disk drives and creates redundant data (stored on disk as parity information) by using a logical exclusive-OR (XOR) operation on all the devices in a set. The XOR of all the devices, called the Checksum, can be used to rebuild data if a device (or sector) is unreadable.

Checksum has several drawbacks. Failed disk devices must be replaced manually to initiate recovery. Updates to data are overhead-intensive and hinder performance. Checksum requires more main memory, thus increasing costs. Notably, the system is inoperable during recovery.

Mirroring

Disk mirroring is typically performed through host software that, when activated, groups disk units into "mirrored pairs" and maintains exact copies of each disk volume. If a disk unit fails, the system can continue operation by accessing the other drive in the pair. The AS/400 implements a mirroring system that dynamically selects a "mate" device by choosing a disk that demonstrates the best availability characteristics (i.e., the device is on a separate bus, I/O processor, or I/O controller) in an attempt to minimize single points of failure.



S Executive's Briefing

tes: Mirroring Takes the Lead

M C Corporation

Due to rapidly falling disk prices and the increased need for high availability, disk mirroring is on the rise at AS/400 sites (see Figure 1). Not only are more sites mirroring, but customers are increasing the amount of data being mirrored (see Figure 2).

High-Availability DASD Subsystems

High-availability DASD subsystems incorporate various levels of redundancy within the disk subsystem. Their price increases as levels of protection increase. Disk devices, controllers, cache memories, fans, power, and even microcode – all candidates for failure within a subsystem – may require protection.

High-availability subsystems commonly use RAID 5 to protect head disk assemblies. Like Checksum, RAID 5 uses parity information to secure data in the event of a failure. RAID 5's advantage is that it offers DASD protection with less CPU and memory overhead than Checksum and protects storage with less disk capacity than is required for mirroring.

RAID 5's biggest drawback is poot write performance due to its "Write Penalty," incurred by the need to conduct four operations duting a write. "Wtite Assist" techniques such as the Write Assist Device (on IBM's 9337) or write caching can compensate for the RAID 5 write penalty. These techniques add costs to the subsystem and can somewhat offset RAID 5's pricing advantages relative to mirroring. In general, the more effective the write assist technology (i.e., the higher the performance), the more costly the subsystem will be.

Figure 2

cities Are on the Rise

GBs Installed at AS/400 Sites

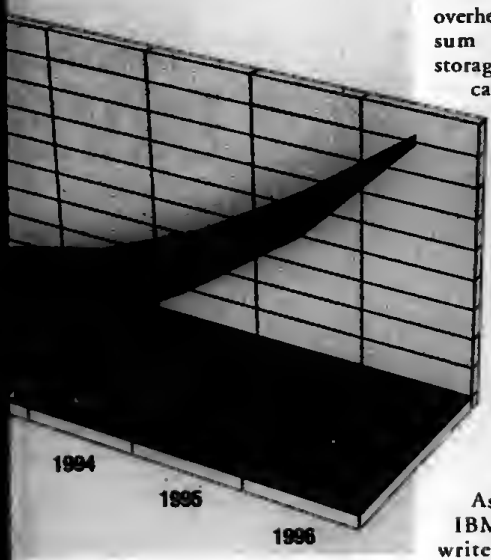


Table 1

Advantages and Drawbacks of AS/400 DASD Protection Methods

Method	Advantages	Drawbacks
Checksum	Lower disk overhead than mirroring	Memory and CPU hog Poor update performance Recovery hangs system
High-availability subsystems	Lower disk overhead than mirroring	Poor update performance
Host mirroring	Good read performance Instant recovery of data Increased fault tolerance	Need 2X disk capacity
Journaling	Simple, inexpensive	Recovery from tape

Conclusions

Selecting the right DASD ptotection method involves trade-offs. Users need products that meet diverse performance, cost, and protection requirements. High-availability DASD subsystems will continue to evolve and improve, particularly in the area of bettet write cache techniques. Their popularity and matket penetration will also increase. Nonetheless, these subsystems are likely to coexist with host mirroring for several yeats. Furthermore, standalone subsystems will nevet deliver the fault-tolerance levels of mirroring, which can extend its protection beyond the subsystem and into CPU resources.

– David Vellante,
Senior Vice President,
International Data Corporation

For more information call EMC Corporation at (800) 424-3622.

Raymond L. Manganelli

Define 're-engineer'

During the past three years, U.S. companies have faced an unprecedented number of competitive challenges. And the future promises more of the same. To survive, companies must make drastic changes in the way they do business.

That's why a growing number of senior executives are attempting to boost productivity, quality, customer service and efficiency — all at the same time — by fundamentally redefining what employees do and how they do it. When implemented correctly, this approach to organizational improvement — known as business process re-engineering — produces breakthrough gains in process performance.

Too often, however, re-engineering programs fail to achieve such gains. The problem with these programs is that they are poorly defined and too time-consuming to satisfy most senior executives' needs.

Poor definition

Viewed by many as a euphemism for "downsizing," "restructuring" or "automating," the term re-engineering is too imprecisely defined to meet many of its stated objectives.

In a recent national survey of 121 senior executives conducted by my company, Gateway Management Consulting, Inc., 54% of the senior executives responding said they have an incorrect understanding of what the term re-engineering means.

When asked to define the term, these executives provided answers such as "technology changes" and "cost reduction." While business process re-engineering often impacts technology, products and costs, it involves the redesign of an entire business process — for example, work flows, policies, procedures, information systems, external interfaces and organizational structures.

Of those executives who say they do understand what the term means, many still mismanage their re-engineering programs by failing to consider the issue of timing.

In its survey, Gateway found that 59% of the respondents need to see the results of their re-engineering programs in one year or less, and 91% in two years or less. Yet the average re-engineering program today takes between three and five years to produce meaningful results.

Until the business community arrives at a precise definition of what re-engineering is and devises a methodology for achieving rapid results, re-engineering will produce little more than marginal gains in business performance.

The distortions

The primary source of executive confusion is inflated expectations. Many re-engineering gurus promise executives a tenfold improvement in overall business performance — a goal that is unachievable for most organizations. No matter what a company's ailment — shrinking profits, rising costs, dissatisfied customers, declining market share — these gurus are peddling re-engineering as the miracle cure.

This approach distorts organizational priorities in three critical ways. First, it causes executives to forego vital, value-added re-engineering projects in favor of projects yielding a promised 80% reduction in cost. Second, it encourages the wrong companies to re-engineer.

Typically, companies in need of 80% cost savings are candidates for financial restructuring or crisis management, not re-engineering.

Third, it causes the right companies to re-engineer incorrectly. Often, the only way to achieve savings of enormous magnitude is to slash head count, relocate operations and freeze capital investment. That isn't re-engineering. It's demolishing your current business.

The CIO's role

In many cases, the CIO reinforces these distortions by limiting the focus to cost-reduction opportunities. For the CIO, the challenge is to stay within the information systems budget while continuing to meet user needs — a challenge that places a strong emphasis on cost.

According to a second national survey conducted by Gateway and answered by 251 CIOs, the information officer's top priority is cost — more important than flexibility, service, availability and user satisfaction by a wide margin.

By focusing too narrowly on cost rather than on overall process performance, however, many CIOs transform re-engineering programs into enterprise-level expense reduction exercises.

To qualify as re-engineering — and produce dramatic results — an improvement program must enhance quality, increase revenue *and* optimize costs.

The real potential

I believe that a viable approach for achieving these goals is "rapid re-engi-

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neering" — a modular re-engineering tool designated to identify and implement opportunities for substantive performance improvement with a one-year return on investment. Rapid re-engineering is a five-stage program:

- **Stage 1: Preparation.** Mobilize, organize and energize the people who will perform the re-engineering project.
- **Stage 2: Identification.** Develop a customer-oriented process model of the business.
- **Stage 3: Vision.** Select processes to re-engineer and formulate redesign options capable of achieving breakthrough performance. While redesigns may be enabled by technology, they should not be driven by information systems capabilities.
- **Stage 4: Solution.** Define the technical and organizational requirements for the new process and develop detailed implementation plans.
- **Stage 5: Transformation.** Implement your re-engineering plans.

This five-stage methodology helps companies realize rapid, high-impact improvements in strategic areas of their business.

In one case, rapid re-engineering was used to help a manufacturer boost efficiency by 70% and accuracy in its order-fulfillment process by 100%. This process, which originally involved 83 cumbersome steps, was streamlined to 23 value-added steps. Within one year, profits had risen dramatically, market share had grown, and customer satisfaction was at an all-time high.

The commitment

Achieving such results requires enterprise-level commitment, management expertise and a great deal of work. To date, too few organizations have been willing or able to meet these requirements. Seduced by unrealistic expectations and a thirst for cost cutting, many CEOs and CIOs have crippled their organizations with massive restructurings and layoffs.

In an environment of rapidly changing technologies, treacherous competition and escalating customer demands, only the strongest companies will survive. Most re-engineering programs, as practiced today, weaken organizations rather than strengthen them.

Despite inflated promises of 80% improvement, these programs deliver too little, too late — at too high a cost. Rapid re-engineering is a more attractive option. It helps companies get back on their feet quickly and cost-effectively and strengthens them to compete in today's challenging economy.

Manganelli is the president and chief executive officer of Gateway Management Consulting, a New York consulting firm.

Calendar

AUG. 1-AUG. 7

Siggraph '93. Anaheim, Calif., Aug. 1-6 — Contact: Siggraph '93 Conference Management, Clarendon Hills, Ill. (708) 850-7843.

Tools USA 1993. Santa Barbara, Calif., Aug. 2-5 — Contact: Tools Conferences, Santa Barbara, Calif. (805) 685-1006.

Downsizing Expo. Santa Clara, Calif., Aug. 3-5 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

AUG. 5-AUG. 14

Sounds of Change: Emerging Technologies/Re-engineering State Government. Nashville, Aug. 9-11 — Contact: National Association of State Information Resource Executives, Lexington, Ky. (606) 231-1970.

AUG. 15-AUG. 21

Share Summer 1993 Meeting. Washington, D.C., Aug. 15-20 — Contact: Share headquarters, Chicago, Ill. (312) 644-6610.

International Networking Conference '93 (INET). San Francisco, Aug. 17-20 — Contact: Universities Space Research Association, Mountain View, Calif. (415) 390-0317.

Client/Server '93 East. Washington, D.C., Aug. 17-20 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-5717.

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Interop '93. San Francisco, Aug. 23-27 — Contact: Interop Co., Mountain View, Calif. (415) 941-3399.

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Fed Micro '93 CD-ROM and Multimedia Conference and Exposition. Washington, D.C., Aug. 31-Sept. 2 — Contact: Tom Lauterback, National Trade Productions, Inc., Alexandria, Va. (703) 683-8500.

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QUALITY CONSCIOUS

Is your company going after a quality prize such as Malcolm Baldrige or Class A manufacturing? IS chiefs from companies such as Ritz-Carlton and ICI Films say be prepared to overhaul systems, act as a standard-bearer or spruce up current data-gathering methods.

BY JULIA KING

Rob Nelson

"In the quality process," Bruce Speckhals says, "IS is a facilitator."

He should know. First as controller, then as vice president of information systems at Ritz-Carlton Co., Speckhals and the IS group were integral to the Ritz's becoming only the second service company ever (Federal Express Corp. was the first) to win the prestigious Malcolm Baldrige National Quality Award. It did so in 1992.

The technology that put it over the top is a unique guest-recognition system that places guest preference information on-line for all employees. The system depends on information feeds about guests gathered from all Ritz employees and inputted into networked PCs. Because all employees have access to guests' likes and dislikes, the thinking goes, the hotel has been able to offer customers great service (see story page 91).

But, Speckhals and other IS chiefs involved in quality efforts say, hard-

Quality conscious, *page 90*

Source: American Electronics Association, Santa Clara, Calif.

Quality conscious

CONTINUED FROM PAGE 89

ware and software alone aren't likely to cure a company's quality problems. Just as important is IS' skill to gather and feed back data throughout the quality process. This information can be used to measure a company's progress against recognized quality standards such as the Baldrige criteria.

As the move to quality certification explodes — a 1993 American Electronics Association (AEA) survey of 455 top executives revealed that 92% of their companies are currently using either Baldrige or the ISO 9000 criteria for quality assessment — the spotlight will turn increasingly on IS. Exactly what kind and how much of an effort IS departments have to make to help their companies meet quality standards differs at each company, from ripping out old systems to overseeing data gathering (see box at right). But most companies agree on one thing: IS plays a pivotal part in helping them pass quality muster.

[redacted]

Integration issues

At Wilmington, Del.-based Du Pont Merck Pharmaceutical Co., a $900 million drug manufacturer, IS' main challenges in its quest for quality were to create software-based interfaces between in-place corporate systems and manufacturing resource planning (MRP) II software. It also had to train employees how to use the integrated system in accordance with MRP II techniques and procedures.

The company was shooting for the Class A quality designation, which goes to manufacturing companies that use MRP II to boost quality and productivity and cut costs.

To be certified Class A, manufacturers must, among other things, reduce inventories by 30% or more, improve customer service by 15%, show an overall productivity gain of at least 15% and reduce costs by a minimum of 20%.

"We took the approach not to spend money on new hardware and software, but to put our money and effort into user training, system interfaces and operations support," says Wayne Lerner, director of business resource planning at the company. Du Pont Merck today is a Class A company.

Meanwhile, at Ritz-Carlton, which neither owns nor operates any hardware or software, IS acts as a manager in the quality process, coordinating the work of third-party providers that custom-develop and operate all of the hotel company's applications.

"My major responsibility is developing and overseeing guidelines and making sure all of our hotels follow certain standards," Speckhals explains.

At the other end of the spectrum are companies such as ICI Films, Inc., a $1 billion manufacturer of film for the laminate and packaging industries, whose IS department put in a completely new MRP II software system to facilitate the company's transition to a Class A manufacturing operation.

Documenting achievements such as reduced inventories and costs, improved customer service and productivity gains is clearly a data-intensive process, notes David Hamilton, IS manager on ICI's Class A project. This, he says, may be why some managers at the company kept handing off quality issues to IS, expecting Hamilton's IS team to play the leading role rather than a supporting one in the arduous Class A certification process.

"It was attractive to many people on the business side to punt to IS, have us fix all their problems with systems and just make their problems go away," Hamilton says. "But this doesn't work with MRP II or Class A because what Class A measures is how well all business processes work together."

Ultimately, representatives from manufacturing, finance and customer service joined Hamilton on a cross-functional team charged with framing what Hamilton describes as "a high-level blueprint" of how various ICI departments and facilities needed to work together to meet Class A quality criteria.

"We walked through the business processes step by step and would either change, adjust or blow up as we went," he says.

In order for ICI's polymer plant in Fayetteville, N.C. — certified Class A in February — and its Hopewell, Va.-based film plant to exchange data more efficiently, Hamilton's IS team installed new MRP II software from Cincom Systems, Inc.

The IS team, which fluctuated in size from 16 to 38 members, also developed custom software interfaces between the Cincom system and other in-place inventory control systems.

In addition, IS was responsible for training more than 1,000 employees on how to use the system, an undertaking Hamilton describes as "a monstrous coordination effort."

IS' role in the quality project did not go unnoticed on the business side. "The MRP II system has been a very information technology-intensive project," says J. C. Rubiano, an ICI business planning process manager. "It allowed us to better learn how to change our processes and procedures."

[redacted]

PARTIAL SYSTEMS OVERHAUL. Update interfaces and provide operations support and other tweaks to ensure that systems feed back proper information and support quality efforts.

FULL SYSTEMS OVERHAUL. Replace old systems with new for tracking and gathering data for better reporting.

TRAINING. Make sure everyone uses systems correctly so poor use doesn't translate into poor information.

OVERSIGHT. Set new standards for system use and ensure that everyone knows what quality goals the company is trying to achieve.

Unlike separate PC-based systems previously in place at the two plants, the multisite, mainframe-based Cincom system enables the facilities to exchange material requirements and production data, which is entered into the system by virtually all workers.

"We can plug into what the Hopewell plant needs, then plan more accurately what we need to do in Fayetteville," Rubiano notes.

"Thanks to that kind of visibility, our baseline of 24 million pounds of inventory has dropped to 12 million pounds," he says.

Hard times ahead

Dee Emsley-Miller, project leader of pharmaceutical support systems at Du Pont Merck, confirms that implementing an MRP II software system — and using it properly to meet quality goals — is indeed an information technology-intensive process.

That's why she advises other IS support people just starting out to "prepare not to take any time off or vacations."

For Emsley-Miller, the main IS challenge was creating software interfaces between custom corporate applications running on a Hewlett-Packard Co. HP 3000 computer in Wilmington and Dun & Bradstreet Software AMAPS MRP II package, which was running on another HP 3000 at a plant in Puerto Rico.

Additionally, Emsley-Miller needed to set up communications links with a third facility in Garden City, N.Y., which needed to exchange information with both the Puerto Rico and Wilmington sites.

"Our whole focus was to take what we already had and make it work," she says.

As it turned out, "all of the software worked well on its own," Emsley-Miller says, "but we continue to run into problems constantly in getting things to talk to each other."

FYI BOX

Where to go for quality certification information

- **Malcolm Baldrige National Quality Award**
  The National Institute of Standards and Technology
  Office of Quality Programs
  (301) 975-2036
  Provides award criteria information

  American Electronics Association
  (408) 987-4200
  Publishes "The Road Map to Total Quality Commitment"

- **Class A certification**
  (Denotes expansive and quality use of MRP II)
  Gray Research
  (608) 776-9211

  R. D. Garwood, Inc.
  (800) 241-6453
  Provides information on certification

- **Individual state quality awards**
  The National Institute of Standards and Technology
  Office of Quality Programs
  (301) 975-2036
  Has listing of awards given by state government

- **ISO 9000**
  The National Institute of Standards and Technology
  (301) 975-4021
  Publishes "Questions and Answers on Quality, the ISO 9000 Standard Series, Quality System Registration and Related Issues"

  Software Quality Committee
  American Software Association
  (703) 522-5055
  Publishes guides for ISO compliance

  American Society for Quality Control
  Registrar Accreditation Board
  (414) 272-8575

  AEA ISO 9000 Resource List
  American Electronics Association
  (408) 987-4200

YES, SIR, AT YOUR SERVICE!

Ten people are tapping their feet in the morning checkout line at the Ritz-Carlton Hotel. All 10 have either a plane to catch or an appointment to keep, and they are getting more irritable by the minute.

The frazzled front desk clerk telephones hotel controller Bruce Speckhals, who is meeting with other Ritz-Carlton executives in an upstairs conference room. Within minutes, Speckhals and the other executives are in the lobby, pouring hot coffee and freshly squeezed orange juice in an effort to appease angry guests waiting in line.

But the next week, and sometimes as soon as the next day, the same scene would repeat itself.

Looking back on those mornings of several years ago, Speckhals, now vice president of IS at the Atlanta-based luxury hotel company, recalls how "we were always attacking the wrong thing." Without adequate information, including data on reservations and preferred checkout times, hotel managers and staff worked from crisis to crisis, without ever getting to the root of the problems, he says.

Today, thanks to Reserve, a companywide custom on-line reservation system furnished through Covia, United Airline's global communications network, Ritz management knows beforehand when a guest will arrive and check out, and they can plan front desk staffing and other services accordingly.

Moreover, if a guest has been to any one of the 28 Ritz-Carlton hotels at least once before, the staff also knows things like whether he or she prefers chardonnay or champagne, and how to press a business suit to the guest's liking.

This kind of information about customers' preferences is collected by bellmen, desk clerks, waiters and other staffers. "They write down things they overhear in elevators or comments dropped at checkout time," says Candace Zimmerman, corporate director of reservations. The hotel also conducts surveys. Data-entry clerks enter all this information on guest preferences into hotel-based PCs, which are linked over the Covia network.

Ritz-Carlton IS chief Bruce Speckhals: 'We were always attacking the wrong thing.'

Like reservation data, information in the "guest recognition system," a custom application developed for the hotel by Covia, is available to all hotel personnel.

"The idea is that if a guest wants *The Pittsburgh Press* in his room wherever he goes, or if he wants rocks in his pillow, the next time he stays with us, he won't have to express that desire," Speckhals says.

"What we're trying to do is create a mystique that suggests to guests that they will never have to ask for anything," Zimmerman says.

This is one reason why, after almost two years of work on the project, Du Pont Merck has decided to pull the AMAPS system, custom interfaces and existing business applications, replacing them with System Software Associates' Business Planning Control System software.

"It's progress, I guess," Emsley-Miller says of the pharmaceutical company's decision.

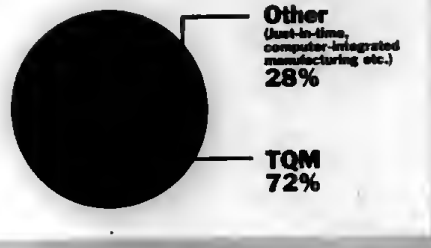
But as Lerner sees it, the IS department's work on the AMAPS system has not been a wasted effort.

"Had IS not implemented MRP II systems using AMAPS, moving to the SSA system would have been a total shock," he says. "As it is, it will now just be a transition."

Also, Lerner notes that thanks in part to IS' implementation of the MRP II software — as imperfect as it was — Du Pont Merck has "reduced inventories substantially, eliminated warehouse space and eliminated back orders that were due to process problems."

Point of low return?

While companies pick Total Quality Management (TQM) as their top quality program . . .



. . . most are seeing only moderate improvements in terms of defect reductions

Base: 485 senior business managers

Source: American Electronics Association, Santa Clara, Calif.

Proper information

Investing in the wrong information system was the very thing Granite Rock Co. wanted to avoid in 1986 when it started tracking customer preferences as a means to improving quality. The quality standard it chose was the Baldrige Award, which it won six years later in 1992.

"When you first make the decision to focus on quality, you really don't know what information you need to do that. And because you don't know, you have the potential to drive IS people nuts if you start in on a system," says Bruce Woolpert, president and chief executive officer of the Watsonville, Calif., building materials supplier.

That's why seven years ago Granite Rock decided to equip its employees with PCs to collect data on customers and their preferences of spreadsheet programs.

"The PCs gave us the flexibility to start tracking information right away," Woolpert explains. It also freed up Granite Rock's IS staff to work on GraniteXpress, the company's automated teller machine-like system for loading building materials onto trucks.

Using GraniteXpress, a truck driver inserts the equivalent of a credit card into a terminal, keys in the type and amount of material he wants, then proceeds to the loading facility where the truck is filled over an electronic scale.

The service, which operates 24 hours a day, has reduced the time a trucker spends at the quarry to nine minutes. Before GraniteXpress, it took 24 minutes.

According to IS manager Chuck Mason, the programmer/analyst dedicated to the GraniteXpress project "lived at the quarry location day and night." Her job, he says, was not to write custom code — a task that was done by an outside engineering firm — but to understand exactly how the whole system worked. This way, the company's seven-person IS department could support the system once it was completed.

GraniteXpress is just one of several information technology-intensive projects that helped Granite Rock win the Baldrige Award, according to Woolpert. During the past few years, the company also has invested substantially in computer-controlled processing equipment. Given its widespread use of statistical process control, Granite Rock can assure customers that its products exceed specifications, he notes. Its concrete products, for example, consistently exceed the industry performance specification by a factor of 100.

Mason says IS' primary role throughout the quality process has been gathering data from these various processors and delivering it back to the rest of the organization. For IS at Granite Rock, the true value of the Baldrige is as a yardstick.

"I don't look at the Baldrige as a win but as a measure I can use to see where our company stands against the rest of the world," Woolpert says. ■

King is a free-lance writer based in Ridley Park, Pa.

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Network operating systems: A must for most

By Leslie Goff

IT'S NO LONGER A good time to pick up local-area network operating system skills — it's a critical time. Learning a LAN operating system may not garner you an immediate raise or promotion, but experts say a thorough understanding of how data and applications flow over a network and how to manage a LAN operating system environment is essential for long-term career survival.

"Everyone in IS must become LAN-literate," says Larry DeBoever at DeBoever Architectures, a network consulting firm in Acton, Mass. Information systems professionals should be able to handle tasks ranging from the control of user access and authorization to server tuning and configuration and a variety of tasks in between. "It will just be expected," DeBoever adds. "We don't pay mechanics more to work on new cars, but they learn how because if they don't, they'll find themselves on the street."

Opportunity exists for individuals with working knowledge of one or more LAN operating systems at almost any large company, but telecommunications, health care and public utilities are emerging as hotbeds of development activity, requiring expertise in programming distributed applications and network management. Companies in these industries — all of which are facing major changes from deregulation to managed health care — are struggling to keep costs down and service up.

Opportunities galore

Cheryl Hetrick Ball, a senior industry analyst in client/server applications service at the Business Research Group in Newton, Mass., says she believes this opens up IS job opportunities both in and out of the "glass house." As IS decentralizes, departmental business analysts will need a LAN operating system background for applications programming, and the centralized IS organization will provide LAN management expertise.

Titles and responsibilities for individuals with LAN applications programming and management skills are evolving and have more to do with how a company is organized and the background of the staff member than with status or prestige.

"The people doing the hiring are struggling with the titles themselves," DeBoever says. "'LAN administrator' can be someone with rudimentary LAN skills, like adding and deleting users. It can also mean superweenie technojock. Don't focus on job titles. Look for anything that suggests systems integration or networking."

At this point, companies are moving so rapidly toward distributed computing that anyone with some LAN programming or systems management experience can profit from learning one or more LAN operating systems. Novell, Inc.'s NetWare leads the market with an estimated 65% to 70% share, followed by Microsoft Corp.'s LAN Manager, IBM's OS/2 LAN Server and Banyan Systems, Inc.'s Vines. Demand is greatest for NetWare experience, but don't let that deter you, says Kathy Anderson, manager of network systems development at Sprint Corp. in Kansas City, Mo. "Most people can cross from one environment to another," she says.

Hot pursuit

In fact, since Novell released NetWare 4.0, which employs global naming services, IS departments have been actively seeking candidates with Vines experience, notes Matt Cain, workgroup computing strategies program director at Meta Group, Inc., a consultancy in Westport, Conn.

Global naming services, incorporated into Vines from its beginning, enable users to transparently access data and applications anywhere on a wide-area network just by logging on to a LAN. Writing a comprehensive global naming scheme requires programmers and network managers to understand the hierarchical model of the organization, Cain notes.

IS staff members cannot slide by on LAN operating system experience alone, however. Phillip R. Pecora, a senior network engineer at Busch Entertainment Corp. in St. Louis, stresses that a repertoire should also include connectivity experience, familiarity with other operating systems and a knowledge of database management systems.

Goff is a free-lance writer in New York.

Career booster

Learning a LAN operating system may not increase your pay right away, but it will keep your career humming.

Acquiring such skills will position you to jump to another company, which observers agree is the best way these days to improve your status.

Titles that require these skills vary from Certified Network Engineer to LAN administrator, with responsibilities such as overseeing and managing LANs and WANs and developing distributed database applications and end-user support.

Depending on experience and salary history, salaries range from $35,000 for entry-level programmers to $60,000 for network managers and project leaders, according to IS professionals and help-wanted ads.

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Easing into client/server

By David A. Kelly

HOW DID KEVIN Fleischood, systems engineer at Sabre Technology Group, a unit of AMR Corp., go from programming in IMS PL/1 to developing client/server applications? He did it gradually. First he learned how to use PCs on his own at home, and then he took classes in C language and Unix. Finally he polished those skills as part of a team developing a client/server replacement for Sabre's Integrated Capacity Planning System (ICAPS).

Fleischood spent 15 years programming mainframes, working primarily in MVS using CICS Cobol to develop financial, accounting and payroll applications. He joined AMR in 1984, and four years ago he was named project manager for ICAPS, which replaced Sabre's 15-year-old IMS PL/1 ISPF/Dialog Manager airline-scheduling application that was falling apart.

ICAPS is a Unix-based system written in C and Oracle Corp.'s Oracle 6.31 under the Open Software Foundation's Motif graphical user interface (GUI). It uses RISC-OS from Mips Computer Systems, Inc. and runs on 70 million instructions per second workstations.

Fleischood purchased a PC and got familiar with it at home. He learned Windows and Borland International, Inc.'s C++ and made sure he knew the intricacies of DOS. He read through the manuals, went through the programming examples and experimented by altering them slightly and testing. According to Fleischood, it took six months of technical reading and experimentation on his PC before he felt really comfortable with the PC environment.

AMR's Kevin Fleischood *took advantage of company-sponsored training*

Making contacts

Fleischood then took advantage of company-sponsored training. "We went through four different week-long classes, Beginning C and Unix, and then Intermediate C and Unix." Because he was unable to find a satisfactory Motif (an X Window System tool GUI) training course, Fleischood and his team members were forced to learn Motif from books and by going to shows and making contacts. "We had to learn a lot on our own," he says.

Fleischood found that not only was the environment different, so was the programming. "Programming C is quite different from mainframe PL/1 programming. In C you have to be concerned about such things as memory management and GUI issues. For example, in the IMS and CICS character world, you have only one state to a screen, while in Windows you have multiple processes talking to each other, and you have to keep track of many different states."

Fleischood says he feels the biggest challenge in converting is learning how to program in the Windows environment. "At first your C programs will be inefficient," Fleischood says, "C is much more complex than older languages." Another large challenge was learning how to properly and efficiently use remote procedure calls and the network file system.

Fleischood says he is comfortable with his conversion to client/server and says others can make the change.

"When you're starting out, get a PC and try out some current products. Team up with someone who knows the client/server area. Knowledge transfer is key."

Kelly is a client/server and systems integration consultant in West Newton, Mass.

Lessons learned

We asked a few information systems experts to examine Kevin Fleischood's transition from mainframe to PC programmer and add their own suggestions for others facing a similar requirement.

▶ **Lee Ann Bluestein**, senior analyst at Joseph McCall & Co. in Atlanta: "I would recommend the way he did it. Get in on a project where the company is converting from a mainframe platform that you know to a client/server platform.

Another approach to take is to get in on a smaller, less critical project, instead of a mission-critical application.

"Or he could have joined a consultancy that does both mainframe and client/server consulting. He might have had to spend some time on just mainframe consulting to prove himself, [illegible] (this some data [illegible]"

▶ **Steve Dang**, manager of [illegible] at Sears, Roebuck and Co., in Chicago: [illegible] to make the transition a little easier slowly by developing one application at a time. If you have that luxury."

▶ **Robert Wesson**, IS supervisor at Augustus Co. in Louisiana, Mo.: "Try to exploit the knowledge of peers in users by attending user groups. You might be able to find someone you can use as a mentor.

"If you're getting into Unix, you might be able to tap into the broad Unix culture by using the Internet.

"You might also be able to find a PC-based training package, such as one for Unix system administration, to get familiar with some pieces of the client/server world."

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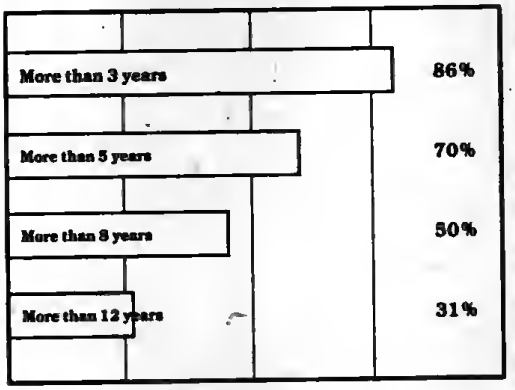

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SYSTEMS ANALYST (REF. #[illegible]) to analyze, design, develop & implement comp s/ware for clients' EDP systems, incl. design & develop Business Info Directory, incl. study & analyze functional req; design & develop on-line & batch process; testing; installation & user training; & providing tech support for overall design for apps using IBM 3090, MVS/ESA, DB2, SQL, QMF, C/370, SCLM, ISPF/PDF, INSPECT, REXX, JCL & TSO. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs. college ed. plus 3 yrs. of exp. in related occp in lieu of req. education & exp. REL EXP: s/ware development; & use of IBM 3090 under MVS envmnt; ISPF/PDF, DB2, QMF, JCL & SQL. Pay is $34,000/yr. 40 hr/wk.

SYSTEMS ANALYST/PROGRAMMER (REF. #[illegible]) to analyze, design, develop & implement computer s/ware for clients' EDP sys. incl. analyses, design & develop distributed financial sys. incl. design & develop Graphical User Interface, on IBM Class Libraries & Presentation Mgr of OS/2 2.0; interface databases using DRDA which uses APPC LU 6.2 communication for accessing data on IBM 3090 mainframe, design server/requester config to set up communication btwn PS/2 workstation & IBM 3090 mainframe; & configuring VTAM on mainframe & communications Mgr of OS/2 on PS/2 workstation using IBM 3090, IBM PS/2, Presentation Mgr, Database Mgr & Communications Mgr of OS/2 2.0, C++, C, DRDA using APPC LU 6.2. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/ware Engg or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: design & develop apps system using OS/2 op sys on PS/2 workstation; IBM 3090 & C, develop programs using APPC or for testing APPC; & developing apps for Network communication. Pay in $34,000/yr. 40 hr/wk.

SOFTWARE ENGINEER (REF. #[illegible]) to consult clients to ascertain & define business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl. analyze, design, develop & implement computer s/ware for clients' EDP sys. incl. analyze, design & develop retailing outlet sys such as Purchase Mngmnt, Sales & Invoicing, Price Mngmnt & Scheduling & Forecasting, incl. process/data flow design, meet users to gather req & overall design of apps entry part of sys as well as tech support for design of apps using INFORMIX RDBMS & INFORMIX 4GL on UNISYS 6000 UNIX based mini hardware. C & UNIX shell programming. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in the job offered or & yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/Ware Engineer or Consultant. Will accept 3 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP: in whole or in part, design & development of sales & invoicing & purchase mgmt sys; & using INFORMIX RDBMS, INFORMIX 4GL, C & UNIX based mini h/ware. Pay is $34,000/yr. 40 hr/wk.

ANALYST PROGRAMMER (REF. #25193) to consult clients to ascertain & define business req or problem areas & utilize tech expertise to provide solutions to clients' needs, incl. analyze, design, develop & implement computer s/ware for clients' EDP sys. incl integrated welfare system. Incl. gathering & validating user req, process/data flow design (using Analysis & Design workstations of an Application Development Workbench & WordPerfect), assist database admn in data modeling, overall design & development of Eligibility Determination & Benefit Calculation part of System. The overall development of the application will be on IBM 3090 mainframe using DB2, IMS-DB, CICS/VS, COBOL II, TSO/ISPF & Hogan Systems. ED & EXP: Bachelor's in Comp Sc, Engg, Sys Anal or Math & 2 yrs exp in job offered or 2 yrs exp as Prog, Sys Prog, Prog/Anal, Sys Anal, S/Ware Engg or Consultant. Will accept 2 yrs of college ed plus 3 yrs of exp in the related occupation in lieu of the req ed & exp. REL EXP in whole or in part: s/Ware design, development & testing; & use of IBM 3090, DB2, COBOL II, CICS, TSO/ISPF & IMS-DB. Pay is $34,000/yr, 40 hr/wk.

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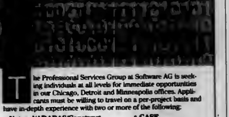

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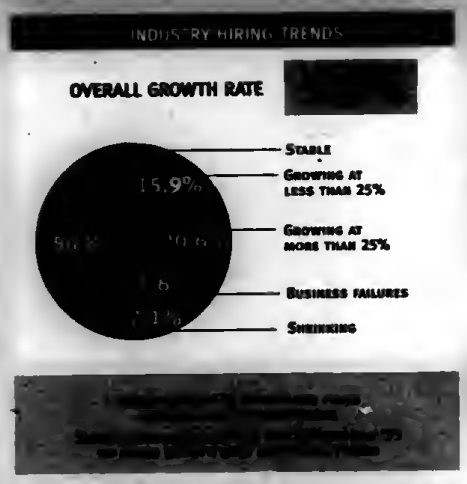

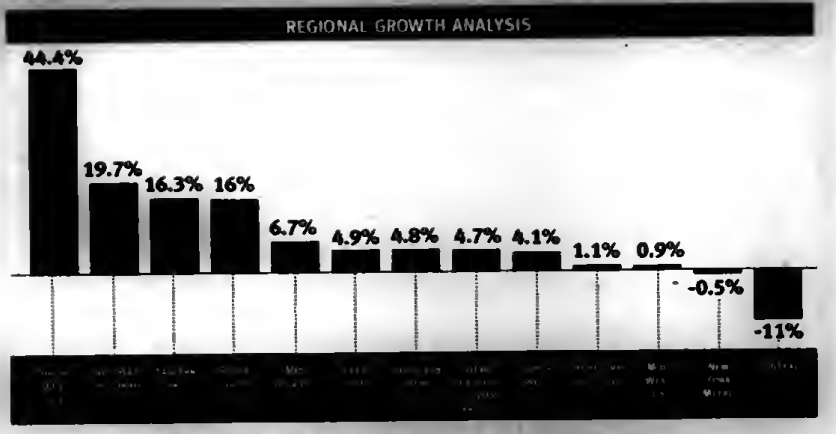

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Hot data? Hot site

By Sheryl Kay

WHAT BEGAN IN 1979 as a relatively elitist solution to disaster recovery — the hot site, an operationally ready, alternate computing facility — has now become the most commonly called-for plan among the majority of technology-dependent companies.

This is due, in part, to new competitors entering a maturing vendor market, says Jeff Marinstein, president of Contingency Planning Research in Jericho, N.Y. Subsequently, the cost of such services has become far more affordable.

Ten years ago, the average monthly cost for a mainframe hot site contract ranged from $15,000 to $20,000. Today, similar services may only cost $3,000 to $4,000 per month. Some sites do exceed $100,000 for monthly contracts, Marinstein says, but these are very rare and often involve dedicated hot sites.

The decision to retain a hot site is not hardware- or software-specific; rather it is based on business economics. "When all other options expose your business to unacceptable levels of risk, including lost opportunity costs," Marinstein observes, "hot sites are appropriate."

To evaluate recovery options, experts suggest conducting a business-impact analysis to determine when the loss of each application would become critical. This study, says David Denmark, senior technical analyst at GTE Data Services in Temple Terrace, Fla., is essential to determining how much backup is required.

The analysis, which can be done in-house or by outside specialists, looks at business functions and the user community. A good way to start, says Ray Small, program director at Gartner Group, Inc. in Stamford, Conn., is by asking each user how their job would be affected if they could not do a certain task on a specific system, such as the number of phone calls they would miss or the revenue lost.

Some companies, such as GAB Business Services, Inc. in Parsippany, N.J., have determined that contracting for the minimum configuration required is most cost-effective.

"If we find we need more resources into a disaster," explains John Nones, director of operations, "they are available to us, all, of course, at a charge."

Mainly mainframes

If your company depends mostly on mainframes, you're in good shape. According to a Gartner Group survey of 240 Fortune 500 companies, 95% have a recovery plan in place for mainframe computing; only 29% have one for voice networks and 27% for PCs. In fact, few hot sites are actually geared for local-area networks and PCs.

For example, Judith Spencer, manager of quality assurance and disaster recovery coordinator at the Board of Trading Clearing Corp. in Chicago, spent two weeks at her company's hot site during the recent Chicago floods. Due to the firm's preparation and its vendor's flexibility, its systems were up in six hours. However, weaknesses in the PC contingency plan were exposed. Fortunately, the company's key systems are not PC-driven, but its PC recovery plan is currently being upgraded.

When you've narrowed down the selection, a vendor's client base should be made available, particularly if the clients are in the same geographic region. "The good news is that you share the expense of maintaining a ready facility with several other companies," Denmark says. "The bad news is that if several of them have been hit by the same disaster, you will all be competing for a limited amount of locally available hot site space."

Typically, vendors assign space on a first-come, first-served basis. When space at one site is gone, ideally, users are assigned hot sites at backup locations, both regionally and nationally.

Kay is a free-lance writer based in Tampa, Fla.

Negotiate the contract

- Hot site contracts are almost always long-term — about five years — so be sure you know what you want. Vendors may attempt to affix heavy financial penalties for early cancellation.
- Pay attention to the terms regarding price increases, upgrade fees, renewal and termination clauses and self-perpetuating contracts; they can be automatically renewed without at least six months prior notice from the user or can be renewed at the date of technical change for the original contract length.
- Contracts should stipulate how many tests are allowed per year (at least two is recommended), as well as testing procedures and the plan for alternate sites.

Hot-site alternatives

Hot-site alternatives are usually less expensive but may lack the necessary backup

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Gainers		Losers	
State of the Art	35.3	Legent Corp. (L)	-47.2
Microbase Inc. (H)	28.3	Microcom Inc.	-34.7
Struct. Dynamics Research	27.3	MathSoft	-31.4
Network Equipment Tech.	19.6	Apple Computer Inc. (L)	-25.7
Group 1 Software	17.6	Storage Technology	-24.4
Trinzic Corp.	17.3	PictureTel Corp.	-20.4
IPL Systems Inc.	16.7	Informix Corp.	-18.6
Gupta (L)	14.7	Walker Interactive Systems	-17.2

Dollar

Gainers		Losers	
Microbase Inc. (H)	4.25	Legent Corp. (L)	-10.50
Struct. Dynamics Research	4.13	Apple Computer Inc. (L)	-9.50
EMC Corp. (H)	3.13	Storage Technology	-9.50
Matsushita Electronics	3.00	Cabletron Systems (H)	-7.00
State of the Art	3.00	Synoptics Communications	-6.25
3M Corp	2.88	Adobe Systems Inc.	-5.25
Texas Instruments (H)	2.75	PictureTel Corp.	-5.00
Gupta (L)	2.75	Intel Corp	-4.88

EDA opportunities

The electronic design automation (EDA) software field periodically undergoes quantum technology leaps that can leave the stocks of once-prosperous vendors straggling behind. Meanwhile, the shares of smaller companies with cutting-edge EDA products can rocket up.

Such a shift — from circuit-level computer-aided design to gate-level engineering in the early 1980s — displaced market leaders Calma, Applicon and Computervision. In their stead, Cadence Design Systems, Inc. (CDN) and Mentor Graphics Corp. (MENT) rose to prominence, according to Peter Schleider at Wessels, Arnold & Henderson.

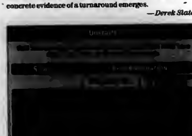
Now the move to a still more sophisticated level of design, third-generation EDA software, threatens to bump Cadence and Mentor Graphics in favor of newer, nimbler firms: Synopsys, Inc. (SNPS) and ViewLogic Systems, Inc. (VIEW).

As recently as 1991, Synopsys was only a tenth the size of Cadence and Mentor Graphics. However, analysts said they expect Synopsys to become the dominant EDA software supplier during the next several years.

ViewLogic features a refreshed product line, and the company has positioned itself well in growth markets with recent acquisitions, according to Needham & Co. analyst Raj Rajaratnam. The stock values of ViewLogic and Synopsys should continue their recent climbs, analysts said.

Cadence and Mentor Graphics both suffered revenue declines in 1992. Analysts agreed that the companies have a chance to revive their flagging fortunes but must introduce strong top-down design tools to do so. Schleider and Rajaratnam each recommended holding those two stocks until concrete evidence of a turnaround emerges.

—Derek Slater



Communications & Network Services

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
OTC	40.00	9.88	3 COM Corp	22.50	-3.13	12.2
NYS	81.00	63.38	American Info Techs Corp	78.38	0.38	0.3
NYS	63.88	40.63	AT&T	63.25	1.38	2.2
OTC	4.06	0.75	Artel Communication Corp	2.94	0.06	2.2
OTC	24.50	10.75	Banyan Systems Inc.	18.00	0.50	2.9
NYS	59.50	44.50	Bell Atlantic Corp	57.25	-1.25	-2.1
NYS	57.50	46.75	BellSouth Corp	16.00	0.75	1.6
NYS	8.50	3.63	Bolt, Beranek & Newman	7.88	0.25	3.3
OTC	18.50	9.50	Brooktrout Technology	13.11	0.88	7.1
NYS	109.00	50.63	Cabletron Systems (H)	99.00	-7.00	-6.6
OTC	23.00	5.00	Centigram Communications (H)	22.38	1.13	5.3
OTC	50.50	19.00	Chipcom Corp (H)	43.75	0.25	0.6
OTC	57.25	22.13	Cisco Systems Inc.	49.75	-4.75	-8.7
OTC	30.38	5.38	Compression Labs Inc	12.38	-0.50	3.9
OTC	38.00	13.00	CrossComm	31.25	-2.50	-7.4
OTC	4.63	1.38	Data Switch Corp	2.88	0.00	0.0
NYS	19.88	12.38	Digital Comm. Assoc.	14.00	0.38	2.8
OTC	12.75	4.00	Digital Systems Int'l Inc	4.75	-0.63	-11.6
OTC	53.38	5.00	DSC Communications (H)	50.75	0.13	0.2
OTC	9.50	5.00	Fibronic Int'l Inc.	5.75	-0.25	-4.2
OTC	24.00	8.75	FileNet Corp	12.50	-0.75	-5.7
OTC	4.38	1.50	Gandalf Technologies Inc	2.88	-0.13	-4.2
OTC	2.06	0.88	Gateway Communications	1.06	0.00	0.0
NYS	15.75	2.88	General Datacomm Inds	8.75	-1.00	-10.9
ASE	3.75	2.00	Go Video	2.50	-0.06	-2.4
NYS	37.75	32.38	GTE Corp	37.00	0.50	1.4
NYS	87.75	62.75	ITT Corp. (H)	87.75	2.63	5.1
OTC	57.88	28.13	MCI Communications Corp. (H)	28.13	0.75	0.9
OTC	6.50	2.00	Microcom Inc.	2.00	-1.06	-34.7
OTC	24.25	4.25	Netrix Corp.	5.00	0.00	0.0
OTC	19.00	7.50	Network Computing Devices (L)	7.50	-1.00	-11.8
NYS	15.00	5.38	Network Equipment Tech.	8.38	1.38	19.6
OTC	20.13	8.00	Network General	11.38	0.00	0.0
OTC	15.75	8.13	Network Systems Corp	8.63	-0.88	-9.2
OTC	50.88	7.50	Newbridge Networks Corp. (H)	48.00	-0.25	-0.5
NYS	46.00	25.50	Northern Telecom Ltd.	25.50	-0.88	-3.3
OTC	35.25	22.50	Novell Inc.	23.25	-2.50	9.7
NYS	92.50	75.00	Nynex Corp.	91.50	0.00	0.0
OTC	30.00	14.50	Octel Communications Corp	22.61	-0.50	-2.2
OTC	6.13	3.38	Penril DataComm Networks	3.88	-0.25	-6.1
OTC	30.50	10.25	PictureTel Corp	19.50	-5.00	-20.4
OTC	15.75	3.63	Proteon Inc. (L)	3.88	-0.25	-16.2
NYS	35.00	16.09	Scientific Atlanta Inc	31.00	1.50	3.1
NYS	46.75	31.75	Southwestern Bell Corp	40.13	0.88	2.2
NYS	35.38	21.63	Sprint Corp	33.75	-0.25	-0.7
OTC	27.00	11.00	Standard Microsystems Corp	15.38	-0.63	-3.9
OTC	18.50	6.88	Stratacom Inc.	13.00	-0.13	1.0
OTC	42.75	10.09	Synoptics Communications	32.00	-6.25	-14.3
OTC	7.00	3.06	Telebit Corp	3.06	-0.44	-12.5
OTC	9.38	2.13	Telematics Int'l Inc.	7.75	-0.13	-1.6
OTC	25.50	14.00	US Robotics	23.13	-0.38	-1.6
NYS	87.75	35.25	U S West Inc	46.00	-0.88	-1.9
OTC	55.30	15.38	Wellfleet Communications	48.25	-3.25	-7.3
OTC	16.75	7.25	Xircom	15.25	-0.50	-5.2

PCs and Workstations

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
OTC	5.56	2.50	Advanced Logic Research	3.50	-0.38	-9.7
OTC	65.75	27.50	Apple Computer Inc. (L)	27.50	-9.50	-25.7
OTC	24.25	11.25	AST Research Inc.	13.75	-1.25	-8.3
NYS	10.75	2.50	Commodore Int'l	3.50	-0.13	-3.6
NYS	61.75	24.50	Compaq Computer Corp	43.50	-1.38	-3.1
OTC	49.88	13.50	Dell Computer Corp. (L)	15.88	-2.63	-14.2
NYS	89.25	50.25	Hewlett Packard Co.	76.00	-5.13	-3.9
NYS	39.25	17.63	Silicon Graphics (H)	37.88	0.63	1.7
OTC	41.00	23.38	Sun Microsystems Inc.	28.75	-1.88	-6.1
NYS	32.38	22.25	Tandy Corp	29.00	6.00	0.0
OTC	7.00	2.75	Zeos International Ltd	3.13	-0.13	-3.8

Large Systems

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
ASE	17.63	4.63	Amdahl Corp	5.00	0.13	2.6
NYS	8.75	8.75	Convex Computer	4.88	0.13	2.6
OTC	6.13	1.88	Cray Computer	2.63	-0.25	-8.7
NYS	30.88	19.00	Cray Research Inc	27.13	0.19	0.5
NYS	13.88	7.61	Data General Corp	9.13	0.00	0.0
NYS	49.25	30.38	Digital Equipment Corp.	39.38	-0.88	-2.2
NYS	39.25	27.75	Harris Corp.	38.25	0.00	0.0
NYS	95.50	45.63	IBM	45.63	-1.00	-2.1
OTC	22.00	3.50	Kendall Square Research	38.38	0.13	0.7
NYS	127.50	83.00	Matsushita Electronics	119.00	3.00	2.6
OTC	23.75	8.25	NetFrame	17.50	0.50	2.9
OTC	36.25	9.25	Parallan Computer	15.50	0.00	0.0
OTC	21.00	8.00	Pyramid Technology	19.50	-0.75	-3.7
OTC	24.00	11.25	Sequent Computer Sys. (L)	12.30	0.00	0.0
OTC	8.75	1.38	Sequoia Systems Inc.	1.94	-0.08	-3.1
NYS	46.38	29.50	Stratus Computer Inc.	30.50	-1.25	-3.9
NYS	16.88	9.63	Tandem Computers Inc. (L)	10.00	-0.38	3.6
OTC	23.50	10.63	TriCord Systems	21.75	5.00	4.8
NYS	13.88	7.75	Unisys Corp	11.50	-0.38	-3.2

Software

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
OTC	74.00	25.25	Adobe Systems Inc.	53.75	-5.25	-8.9
OTC	20.75	10.75	Aldus Corp	13.75	-1.00	-6.8
OTC	14.75	5.50	American Software Inc.	7.25	-0.38	-4.9
OTC	28.13	10.00	Ask Computer Systems	50.75	-0.75	-8.5
OTC	16.75	32.00	Autodesk Inc.	44.50	-3.00	-6.3
OTC	12.00	2.50	Bachman Info. Systems	2.75	-0.44	-13.7
OTC	63.00	31.75	BGS Systems Inc	31.75	-0.75	-2.3
OTC	84.13	38.75	BMC Software Inc.	51.50	-4.38	-7.8
OTC	28.25	17.00	Boole & Babbage	24.25	0.25	1.0
OTC	49.00	17.50	Borland Int'l Inc	20.50	-1.00	-4.7
OTC	5.38	5.00	CE Software	3.50	0.25	7.7
ASE	34.88	6.50	Cheyenne Software Inc (H)	31.63	-1.00	-3.1
OTC	19.50	8.75	ChipSoft	9.00	-0.50	-5.3
OTC	9.13	5.63	Cognos Inc.	8.75	0.00	0.0
NYS	31.38	11.25	Computer Associates	28.50	-1.13	-3.8
NYS	13.38	2.25	Computervision Corp.	3.25	-0.13	-3.7
OTC	34.25	19.25	Compuware Corp	26.50	0.50	1.9
OTC	14.75	5.75	Comshare Inc.	6.50	-0.25	-3.7
OTC	19.13	10.75	Corel Corp. (H)	17.25	-1.38	-7.4
OTC	15.25	5.00	Easel Corp.	8.13	-1.88	-12.5
OTC	75.25	12.00	4th Dimension	20.25	1.75	9.5
OTC	19.50	5.25	Frame Technology	8.75	0.75	3.8
OTC	19.00	8.38	Group 1 Software	10.00	1.50	17.6
OTC	35.25	14.50	Gupta (L)	21.50	2.75	14.7
OTC	9.00	4.00	Hogan Systems Inc. (H)	8.50	-0.38	-4.2
OTC	25.25	11.25	IMRS	19.00	-0.75	-3.8
OTC	38.00	21.00	Information Resources	35.00	6.63	1.8
OTC	27.25	7.19	Informix Corp	20.75	-4.75	-18.6
OTC	16.75	8.75	Intergraph Corp. (L)	9.38	-0.25	-2.6
OTC	13.63	6.25	Interleaf Inc (L)	6.25	-0.25	-10.7
OTC	10.00	5.50	IntersolV Inc.	6.75	-0.25	-10.0
OTC	16.00	7.75	KnowledgeWare Inc.	11.25	0.75	2.2
OTC	54.75	15.50	Legent Corp. (L)	16.25	-10.50	-47.3
OTC	37.00	14.75	Lotus Development	35.25	0.50	1.4
OTC	23.00	8.00	MathSoft	8.00	-2.25	-31.4
OTC	23.25	5.25	McAfee Associates	5.75	-0.13	-2.1
OTC	11.63	1.88	Mica Software	6.00	0.38	6.7
OTC	12.00	5.25	Mentor Graphics	9.38	-0.13	1.8
OTC	46.00	26.63	Micro Focus (L)	27.63	6.63	2.3
OTC	13.75	4.38	Micrografx Inc.	6.25	0.75	13.6
OTC	98.00	68.00	Microsoft Corp.	81.38	-3.25	-3.8
OTC	51.75	15.75	Oracle Corp.	45.88	-3.00	-6.1
OTC	37.00	16.50	Parametric Technology (H)	33.88	-0.38	-1.1
OTC	40.50	22.50	PeopleSoft	31.75	1.50	5.0
OTC	7.13	3.50	Phoenix Technologies	5.38	0.25	4.9
OTC	40.00	22.00	Powersoft	32.25	1.00	3.2
OTC	41.50	17.00	Platinum Software	25.00	0.88	3.6
OTC	25.00	10.75	Platinum Technology (L)	12.50	0.61	5.3
OTC	61.50	32.75	Progress Software Corp.	44.50	0.00	0.0
OTC	7.38	2.56	Quarterdeck Office Sys.	2.63	-0.44	-14.3
OTC	31.00	14.25	Rainbow Technologies Inc.	31.00	0.75	2.5
OTC	12.75	4.00	Rasterops	8.38	-0.75	-8.2
OTC	15.25	3.63	Ross Systems	10.75	-1.50	-12.2
OTC	27.50	9.61	Sapiens Int'l. Corp. N.V.	24.88	0.00	0.0
OTC	14.50	5.88	Software Publishing Corp.	8.88	0.38	5.0
OTC	12.00	2.38	Software Toolworks Inc.	11.00	0.25	2.3
OTC	3.13	0.75	Spinnaker Software	1.31	0.06	5.0
OTC	12.75	3.25	State of the Art	11.50	3.00	35.3
NYS	24.63	15.00	Sterling Software Inc.	21.38	2.38	12.5
OTC	21.50	8.00	Struct. Dynamics Research	19.25	4.13	27.3
OTC	77.50	25.25	Sybase Inc. (H)	72.00	3.00	4.0
OTC	32.88	5.88	Symantec Corp.	11.75	-0.38	-3.1
NYS	12.50	5.25	Systems Center Inc.	10.25	0.00	0.0
OTC	25.50	10.00	System Software Assoc.	18.75	0.25	1.4
OTC	6.38	2.75	Trinzic Corp.	3.81	0.56	27.3
OTC	22.75	9.13	ViewLogic Systems	19.50	0.75	4.0
OTC	23.50	6.00	Walker Interactive Systems	6.00	-1.25	-17.2
OTC	3.19	1.38	Wordstar	1.50	0.03	2.1

Semiconductors

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
NYS	32.88	8.38	Advanced Micro Devices	23.00	-1.75	-7.1
NYS	22.00	9.38	Analog Devices Inc. (H)	21.38	1.75	8.9
OTC	27.88	7.63	Atmel Corp (H)	24.50	-1.88	-7.1
OTC	5.25	2.75	Chips and Technologies	4.00	0.38	10.3
OTC	39.75	13.00	Cirrus Logic	16.50	0.50	5.1
NYS	15.00	7.88	Cypress Semiconductor Corp(H)	14.30	0.25	1.8
NYS	16.13	8.88	Dallas Semiconductor	15.50	0.75	5.1
OTC	60.63	37.13	Intel Corp.	51.00	-4.88	-8.7
NYS	16.75	4.88	LSI Logic Corp (H)	16.00	0.13	0.8
OTC	22.16	10.41	Lattice Semiconductor	18.50	0.25	1.4
NYS	44.63	13.75	Micron Technology (H)	40.88	-0.88	-2.1
NYS	90.63	60.50	Motorola Inc. (H)	87.25	1.75	1.5
NYS	17.25	9.00	National Semiconductor (H)	16.50	0.50	3.1
OTC	15.75	8.50	Sierra Semiconductor	6.63	-0.25	-3.6
OTC	67.00	22.75	SynOpsys	41.75	-3.25	-8.2
NYS	76.50	50.75	Texas Instruments (H)	72.50	2.75	3.9
OTC	11.75	4.00	VLSI Technology (H)	10.63	-0.25	-2.3
OTC	12.69	2.50	Weitek (H)	10.75	-1.63	-13.1
ASE	9.63	3.63	Western Digital Corp.	3.88	0.00	0.0
OTC	39.25	14.50	Xilinx	38.75	0.50	1.3
OTC	33.00	13.84	Zilog Inc.	26.25	0.75	2.9

Peripherals and Subsystems

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
OTC	40.75	11.00	American Power Conversion	36.50	-1.38	-3.6
OTC	20.16	13.84	Banctec Inc	18.00	-1.25	-6.5
OTC	10.00	8.75	Cambex Corp. (L)	4.75	-0.25	-5.0
ASE	18.38	5.38	Cognitronics Corp.	5.25	0.75	4.5
NYS	25.50	9.00	Conner Peripherals	9.88	-0.13	-1.3
OTC	38.50	10.75	Creative Technologies Inc	30.13	1.63	5.7
OTC	30.75	11.00	Data Race Inc. (L)	12.00	-2.25	-15.8
ASE	17.00	4.75	Dataram Corp	9.13	0.63	7.4
NYS	24.75	5.08	EMC Corp. (H)	24.75	3.13	14.5
OTC	10.50	5.38	Emulex Corp.	6.88	0.50	7.8
OTC	19.00	13.75	Evans & Sutherland	15.75	-0.38	-2.4
OTC	33.00	7.50	Exabyte (L)	8.50	-1.13	-11.7
OTC	20.75	7.09	Intelligent Info. Systems	26.00	-1.00	-3.7
OTC	8.88	3.75	Iomega Corp.	4.06	-0.06	-1.5
OTC	19.50	5.75	IPL Systems Inc.	8.75	1.25	16.7
OTC	24.00	12.50	Komag Inc.	15.38	-0.61	-3.9
OTC	19.63	5.75	Maxtor Corp.	5.75	-0.38	-6.1
OTC	11.75	5.75	Micropolis Corp	6.38	0.13	2.0
NYS	117.00	97.00	3M Corp	110.25	2.88	2.7
OTC	7.75	4.00	Printronix Inc.	7.13	-0.13	-1.7
NYS	17.25	6.88	QMS Inc.	8.00	0.00	0.0
OTC	17.88	9.50	Quantum Corp. (L)	10.13	-0.25	-2.4
OTC	11.88	3.13	Radius Inc.	4.00	0.00	0.0
NYS	16.50	7.63	Recognition Equipment	13.13	-0.13	-0.9
OTC	13.88	3.75	Rexon Inc.	4.75	0.13	3.0
OTC	22.38	12.00	Seagate Technology	17.75	2.13	13.8
NYS	45.00	16.00	Storage Technology	29.38	-9.50	-24.4
NYS	27.88	17.63	Tektronix Inc.	26.38	1.25	5.0
NYS	88.88	70.13	Xerox Corp	74.63	-2.25	-2.9

Services

Exch	52-Week Range		Company	July 16 3pm	Wk Net Change	Wk Pct Change
OTC	21.75	14.88	American Mgmt. Systems	18.63	0.38	2.1
NYS	4.75	2.38	Anacomp Inc.	2.63	-0.25	-8.7
OTC	35.75	18.75	Analysts Int'l	29.00	-0.50	-1.7
NYS	16.13	40.50	Auto Data Processing	48.75	1.38	2.9
NYS	17.75	12.19	Ceridian Corp	14.83	0.00	0.0
NYS	17.38	13.13	Comdisco Inc.	15.13	0.50	3.6
OTC	8.75	4.50	Computer Horizons	7.75	0.38	5.1
NYS	84.75	57.00	Computer Sciences	84.50	2.13	2.6
NYS	9.75	6.50	Computer Task Group	6.63	-1.25	-15.9
NYS	40.50	22.00	CompUSA Inc.	25.25	-2.00	-7.3
OTC	14.75	6.00	Corporate Software	11.00	1.00	10.0
OTC	19.25	7.38	Egghead Discount Software	7.88	0.00	0.0
NYS	35.88	25.75	General Motors E (EDS)	28.13	-0.25	-0.9
OTC	25.50	10.00	Inacom Corp.	21.75	-0.25	-1.1
OTC	15.38	7.25	Intelligent Electronics	15.00	1.38	10.1
OTC	13.13	6.63	Medisel (H)	12.50	-0.25	-2.0
OTC	19.50	5.75	Microage Inc. (H)	19.25	4.25	28.3
OTC	43.00	23.25	Paychex	42.50	0.25	1.8
NYS	87.25	25.25	Policy Management Sys. (L)	29.13	2.38	8.9
NYS	61.38	19.88	Reynolds and Reynolds (H)	60.50	1.25	6.5
OTC	17.75	11.00	SEI Corp (H)	17.00	-0.25	-1.4
OTC	24.38	17.75	Shared Medical Systems	21.75	-1.63	-7.0
OTC	12.63	5.75	SHL Systemhouse	10.63	-0.13	-1.2
OTC	30.75	19.00	Software Spectrum Inc.	29.75	0.75	2.6
OTC	33.75	23.25	Sungard Data Systems	33.50	1.88	5.9
NYS	6.38	1.13	Ultimate Corp.	3.38	-0.13	-3.6

KEY: (H) = NEW ANNUAL HIGH REACHED IN PERIOD (L) = NEW ANNUAL LOW REACHED IN PERIOD
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Briefs

Intel results boom

Citing growing 1486 and Pentium chip sales, Intel Corp. last week posted second-quarter net profit of $568.5 million, a 167% increase from the same period last year. Revenue grew 61% to $2.13 billion, according to the Santa Clara, Calif., company. Intel earned $1.07 billion in the first half of the year, exceeding 1992's total earnings, on revenue of $4.15 billion.

Earnings rise

Motorola, Inc. reported second-quarter earnings of $224 million, a 56% increase from the comparable period last year. Revenue grew 18% to $3.9 billion, fueled by increases in semiconductor, communications and systems sales, the Schaumburg, Ill., firm said.

StorageTek sees red

Continuing delays of its key disk array subsystem and softness in European business caused Storage Technology Corp. to incur a $1.3 billion second-quarter loss. The Louisville, Colo., storage vendor earned $6.9 million in the corresponding period last year. Revenue for the second quarter dropped 8% to $355.1 million, the company said.

SHORT TAKES Digital Communications Associates, Inc. in Alpharetta, Ga., said it posted a $7.2 million fiscal fourth-quarter loss on revenue of $64 million. ... Cambex Corp. in Waltham, Mass., suffered a fiscal third-quarter loss of $5 million on revenue of $10.8 million. ... Chipcom Corp. in Southboro, Mass., reported second-quarter earnings of $3.2 million, a 62% increase from the year-earlier period, on revenue of $35.7 million, a 92% hike over last year. ... Xyplex, Inc. in Boxboro, Mass., earned $2.4 million in its second fiscal quarter on revenue of $19.4 million, increases of 33% and 44%, respectively, over last year, according to the company.

Dell to post first loss

Blames weak overseas market, expansion costs

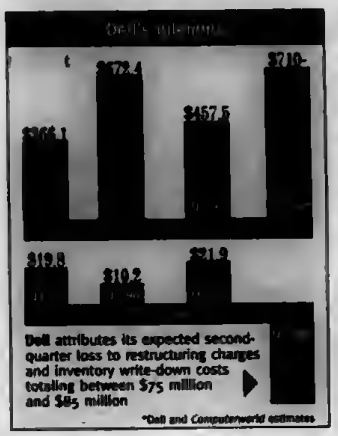
By Michael Fitzgerald
AUSTIN, TEXAS

■ Like a would-be Atlas, Dell Computer Corp. continues to stagger under the weight of its effort to become a first-tier vendor. Last week, the stumbling vendor said it will post its first-ever loss when its current fiscal quarter ends Aug. 1.

Though a Dell spokeswoman said the company expects to see sales reach $710 million to $730 million for the quarter — a 55% to 60% rise from the year-earlier quarter — it expects to lose between $1.65 and $1.85 a share. While the company did not specify a dollar figure, it has roughly 40 million shares outstanding, which suggests a loss in the $66 million to $74 million range.

It appears, then, that the company could have eked out a small operating profit, had it not decided to take an estimated $75 million to $85 million restructuring charge. The loss could cause Dell to default on some of its bank loans, the company said.

Dell blamed its woes on an ambitious international expansion plan coupled with a weakening market overseas, its lack of competitive notebook computers and problems with inventory and supply tracking and control [CW, June 21]. Analysts said



Dell's lean management structure has left the firm unable to handle its rapid growth, but it appears to be addressing this.

"The degree [of the loss] is a slight surprise, but something was going to drop because the type of growth they went through was not sustainable," said Kimball Brown, an analyst at Computer Intelligence/Infocorp in Santa Clara, Calif. "They should be fine down the road."

The company has created a number of new positions this year, filled largely by outsiders, in an effort to revamp its corporate structure to deal with its problems and help position it for future growth.

Joel Kocher, Dell's president of sales, acknowledged recently at an informal press reception at PC Expo in New York that Dell is struggling to handle its growth, and it is working to change its corporate structure to allow it to reach $5 billion in sales by 1996. Dell expects sales to total $3 billion this year.

Dell does not plan any layoffs, but it expects to have some 50 fewer jobs in Europe after it revamps its international organization, the spokeswoman said.

What the future holds

Analysts said the key to Dell's future is how well it executes its restructuring efforts, which will include a revamp of its notebook effort. Kocher said at the reception that Dell would not relabel notebooks to supplement its current offerings, but sources suggested that Dell is considering selling other vendors' notebooks. Dell refused to comment on this possibility.

"Fundamentally, [Dell] seems to be sound; they're just making corrections other vendors have made," said Bruce Stephen, an analyst at International Data Corp. in Framingham, Mass. Stephen warned that for Dell, the coming loss might take some luster off what had been a shooting star, and that "a market slowdown could damage Dell's growth prospects."

Statistical analysis software

MathSoft acquires firm to gain Windows entry

By Michael Vizard
CAMBRIDGE, MASS.

Looking to leverage sales of its MathCAD mathematical calculation software, MathSoft, Inc. has acquired Statistical Sciences, Inc. (StatSci), a provider of statistical analysis software in Seattle.

Valued at as much as $6.8 million under terms of the deal, the acquisition positions MathSoft against SAS Institute, Inc. in Cary, N.C., and SPSS, Inc. in Chicago, both of which currently dominate the statistical analysis software field.

To pay for the acquisition, MathSoft will part with $3.5 million in cash and 348,000 shares of stock. In addition, MathSoft may pay up to an additional $1 million in cash or stocks, depending on the performance of the StatSci division during the next two years.

As a result of this acquisition and other marketing programs, MathSoft said last week that it expects to post a loss for its fourth quarter and fiscal year ended June 30. MathSoft posted revenue of $11.5 million in fiscal 1992, and analysts said they anticipate the company will have revenue of $25 million for fiscal 1993.

Not all or nothing

"There will definitely be competition with companies like SAS, but MathSoft doesn't need for this product to have $100 million in revenues for the acquisition to be successful," said Clare Gillen, an industry analyst at International Data Corp.

According to David Blohm, MathSoft chief executive officer, there is a tremendous amount of overlap between MathCAD customers and the installed base of statistical analysis software.

To take advantage of this, MathSoft intends to focus on making the StatSci software easier to use in a Windows environment.

"We believe that statistical analysis software customers are moving from mainframe-oriented products to interactive software that runs on increasingly more powerful desktop systems," added StatSci general manager Matthew Schiltz.

StatSci software is currently available on Windows, DOS and Unix platforms.

For example, the Veteran's Administration Medical Center in East Orange, N.J., uses StatSci's S-Plus software because it can look at subsets of data in greater depth, according to Dr. Walter Tapp, a biomedical researcher at the center.

Tapp said he uses S-Plus to analyze joint movements, which involves an overwhelming number of data looks and data points.

"StatSci tends to be on the cutting edge of statistics algorithms. The time it would take to normally look at a specific joint movement is monumental, but they have sophisticated data exploration capabilities that allow you to do a lot of hypothesis testing on specific data points," Tapp said.

By the numbers

StatSci's statistical analysis software is based on the S Language technology originally developed by AT&T. The company claims to have 40,000 users and annual revenue of about $9.4 million.

Wysiwyg

What was your very first JOB?

David Mahoney, chairman and CEO of Banyan Systems, Inc., started a painting business in high school. The money from that business helped pay for his college tuition. He went on to earn his degree in biology, which led him to his first job as an engineering assistant at MIT Lincoln Labs. He worked with the solid state physics group doing "X-ray crystallagraphic analysis"; all of the analysis and data collection was done on a computer. That piqued his interest in computer technology.

Steve Ballmer, executive vice president of sales and support at Microsoft Corp., first worked at Procter & Gamble, where he was responsible for marketing a "coldsnap" freezer dessert maker. The product died in test marketing, but he learned about selling packaged food products though grocery stores.

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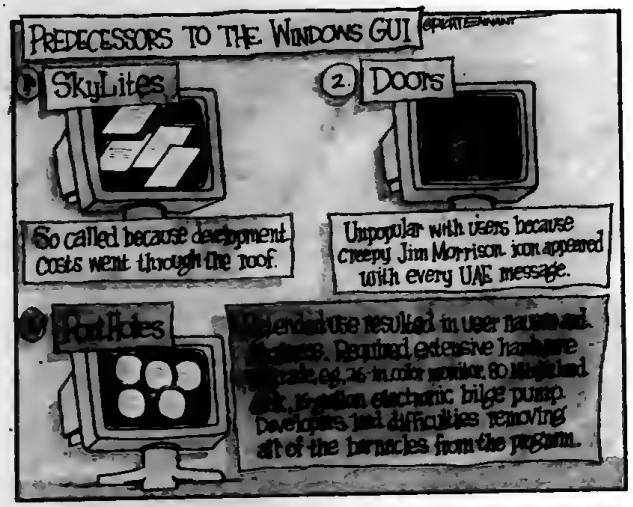
The 5th Wave *by* Rich Tennant



Inside Lines

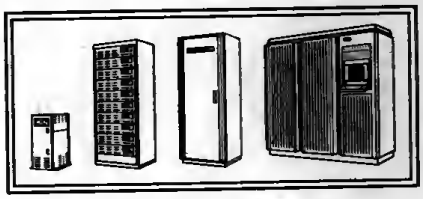
There's one little word that can strike terror into the hearts and minds of Information Services professionals everywhere: downtime. But thanks to the new Symmetrix 5500 from EMC, it's one word you can

And hecause it's hased on EMC's proprietary Integrated Cached Disk Arrays (ICDA™) technology, there's simply no faster way to access data on an IBM or compatihle mainframe computer. The

If your data is mission critical, it's critical you read this ad.

virtually hanish from your vocabulary.

You see, the Symmetrix 5500 ICDA™ is designed with redundant hardware components, proactive maintenance features, a full mirroring option and the ability to repair or upgrade the system with no loss of uptime. In short, Symmetrix 5500 hrings continuous operation to mission critical sites that need access to data 24 hours a day, seven days a week.



The Symmetrix 5500 is part of an entire line of disk storage systems based on EMC's Integrated Cached Disk Arrays (ICDA™).

Symmetrix 5500 also hrings all the features of the Symmetrix Series to mission critical environments: a small footprint, low power and cooling requirements and a two year warranty that add up to reduced cost of ownership and a maximum return on your storage investment.

Downtime can cost your husiness over $100,000 a day. So, if your data is mission critical, make it your mission to learn more by calling 1-800-424-EMC2, ext. LM67C.

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THE STORAGE ARCHITECTS

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